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ORIGINAL ARTICLES.

A CONTRIBUTION TO THE SURGICAL RELIEF OF CANCER OF THE RECTUM: REVISION OF THE STATISTICS TO DATE, WITH SPECIAL REFERENCE TO SACRAL EXTIRPATION.*

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SOME one has well said that the best doctors still try to "give Nature a chance." This should be true, yet the ablest surgeons of our time no longer hesitate to cut out from the internal economy of man all organs save the heart and brain. Gastrectomy was done by Schlatter, and the world marveled at his work. The chondroplastic method of pericardotomy with suture of the heart muscle is no longer fancy, but fact. Lilienthal extirpates the entire colon, the sigmoid and four inches of the ilium for hyperplastic colitis, and his patient lives to tell the tale.

Sarfert stays the ravages of the tubercle bacilli, with its resulting hectic fever and hemoptysis, by draining the multiple abscesses in the lung's apex.

Lange excised seven inches of the rectum after removing part of the sacrum and simultaneously through the yawning wound delivered an extensively adherent, multilocular ovarian cyst, the size of a child's head. Thus, in many ways the beginning of the twentieth century points out marked effort and improvement in the surgical means of alleviating suffering and saving life.

Cancer Defined.—In old St. Paul's churchyard, London, in the year 1751, Robert Brookes printed a book on the subject of physic, which contained the following definition: "A cancer is a hard, round, unequal, painful and generally immovable tumor, of a livid blackish, or leaden color, surrounded with swelled, crooked, varicous vessels, in some sort resembling the feet of a crab; and unless it be extirpated root, branch, and seed, it will be exasperated and strike inward, generate others and increase those already formed." A wonderfully true picture for the time it was written, and even true to-day.

But perhaps a more modern definition* comes from the pen of that distinguished author, Lewis S. Pilcher, who defines under the generic name cancer, "Those new growths, which, after they have once begun their formation, steadily continue the accretion of their own peculiar tissue, invade and replace adjacent tissue, progress at their periphery, while processes of necrosis cause the melting down of parts earlier developed, and, parasite-like, at the expense of tissues among which they develop, continue their progressive invasions and necroses, unchecked by any resisting power in the normal tissues, either already inherent in it or that can be brought to it by any mode of living or of medication."

Probably the most important pathological problem before modern medical science to-day is the mystery surrounding the etiology of cancer; yet it may be asserted with confidence that something definite and tangible has been reached through the untiring efforts and research of Dr. Harvey R. Gaylord.

Along with Major Walter Reed's startling demonstration at the recent Pan-American Medical Congress in Cuba, that the bite of the *Culex fasciatus* is sole cause for the propagation of yellow fever, this almost clinching proof of the protozoal cause of cancer marks the beginning of a new era in medicine, and these may justly be regarded as two of the greatest achievements of scientific research in modern times. For certainly the recognition, separation and cultivation of a disease germ, be it bacterial or protozoal, vegetable or animal, opens up the way for preventive medicine, and immediately suggests means for the relief of thousands of those everlastingly doomed to an agonizing death.

Pathology.—Dr. Warren, the distinguished surgeon to the Massachusetts General Hospital, speaks thus of the pathology:[27] "Carcinoma when found at the anus is of the pavement-cell variety, and when growing from the mucous membrane it appears as a cylinder-cell carcinoma. There are, therefore, in this locality both types of the so-called 'epithelioma.' The pavement-cell form, which takes its origin in the cutaneous coverings of the anus, begins as a warty or papillary growth that breaks down early and ulcerates. It is not unlike cancer of the lip in its early stages. The surrounding parts are more or less hard and infiltrated, and the edges of the ulcer are elevated and sharply defined. The growth spreads inward and involves the mucous membrane, and it invades also the external integument, involving the perineum or the commissure of the vagina and the labia in women. The cylinder-cell carcinoma, which develops from the follicles of Lieberkühn, begins as a more or less exuberant growth, which soon breaks down and develops into a crateriform ulcer involving more or less of the circumference of the bowel. This growth is found some little distance within the rectum, and it is often difficult for the exploring finger to reach its upper margin. The cells are arranged in acini, and they have a strikingly glandular appearance, closely resembling that seen in cancer of the

* Read at the meeting of the West Virginia State Medical Society, Grafton, May 17, 1901.

uterus. It is therefore often called 'adenocarcinoma' or malignant adenoma. This is the commonest variety of cancer of the rectum. Cancer occurs also in the medullary form, but more rarely. It is exceedingly malignant, and it soon infiltrates the walls of the rectum, converting the latter into a rigid tube and gluing it to surrounding parts. Scirrhous cancer is said to occur high up near the sigmoid flexure or in the neighborhood of the prostate. It infiltrates the submucous tissues, and the mucous membrane over it for a time appears healthy. It grows slowly and causes annular stricture, or it is felt as a hard nodule in the wall of the rectum."

Treatment.—Not many years ago a well-known text-book dismissed the subject of treatment in carcinoma of the rectum in words like these: "Treat symptoms and relieve pain as long as possible; as a last resource, do colotomy."

There still exists in the minds of the conservative doubt regarding the operative treatment of this disease. There are those who advocate the palliative colostomy, and are not willing to jeopardize the lives of their patients with any of the methods of excision, unless the neoplasm is engaging the first few inches of the rectum.

Treves[21] writes: "In no case should the peritoneum be deliberately opened, or a portion of the vagina, bladder or prostate excised. Experience has condemned these extensive operations."

Allingham[22] speaks thus conservatively: "To attempt to exercise the rectum when the growth is four inches up the bowel is most unscientific and unsurgical."

Harrison Cripps, surgeon to St. Bartholomew's, says: "If the finger can pass sufficiently beyond the disease to feel a healthy mucous membrane, so far as the height is concerned a satisfactory removal is possible."

Maylard,[23] surgeon to the Victoria Infirmary, gives his opinion as follows: "The question regarding this operation now comes to one of determining whether the good that it can effect sufficiently outweighs the untoward results that frequently follow; in other words, does the prolongation of life and the relief of suffering more than compensate for the lives it shortens and the often additional trouble it causes?"

Having referred to Czerny of Heidelberg, who reported a series of 36 cases operated on by sacral method with a mortality of 19.4 per cent., Maylard continues: "It need hardly be said that the question is one of extreme difficulty; for, even if it could be shown that Czerny's results gave a balance in favor of the operation, in supposedly suitable cases, it far from follows that less experienced operators, in such a grave and comparatively difficult operation, would obtain like good results. Indeed, if one may judge from isolated instances recorded—results argue rather against than for the operation."

These opinions, as will be observed, are from English surgeons of international reputation, and, while they contain much wisdom, they are more conservative than the operators of this country or of Germany are willing to accept. While McCosh referred to the surgeons being in the transition stage nine years ago, to-day, with a technic nearly perfect, surrounded by all of the modern appliances which inventive ingenuity can devise in the line of preventing shock, hemorrhage, and the establishment of almost impregnable barriers against parasitic invasion, at the beginning of the twentieth century, we stand abreast with our brothers in the fatherland, ready to fight this foe of mankind when there seems to be any reasonable hope of conquering.

Erichsen[8] writes that removal of cancer by excision of a portion of the rectum was first performed by Faget in 1739. An inch and a half were removed and the patient recovered. Lisfranc revived the operation in 1826, reporting nine cases with five recoveries. In 1854 Chassaignac used the écraseur in the removal of rectal growths. Nussbaum and Volkmann, in Germany, and Jordan, Allingham and Holmes, in England, worked diligently toward reviving the operation. The surgery of the rectum was developed and brought up to date in 1880 by the publication of Harrison Cripps' interesting work.

Gerster[9] wonders that any surgeon should have had the temerity to attempt to remove any extensive rectal neoplasm after looking into the imperfect and therefore bloody and dangerous procedures devised by Dieffenbach, Velpeau and other early operators.

Stanley Boyd's[10] edition of Druitt's *Vade Mecum* as late as 1887 refers to the high death-rate and sepsis is put down as the chief cause. The mode of approach was primitive, the hemorrhage was inevitably profuse, owing to the limitation of the field of work and the inaccessibility of the pelvic basin and its diseased contents (Gerster).

In 1883 while Richard Volkmann was removing a malignant growth from the sacrum, by accident he opened the sacral canal. This misfortune resulted in no untoward symptoms for the patient, and this fact aroused Kraske, who was then an assistant in Volkmann's clinic. The experimental research along this line led to the publication in 1885 of Kraske's[12] monograph, which revolutionized rectal surgery, reducing, as it did, the mortality after excision from 57 per cent. (Iversen) to 19 per cent. (McCosh).

Kraske's Method.—With the patient on the right side, a median incision is made, extending from a point opposite the third sacral foramen to the anus. After thorough retraction of the soft parts, the great gluteal muscle is loosened from its sacral attachment. The coccyx is removed and the lower fibers of the sacrosciatic ligament are divided. With a chisel, the left half of the lower part of the sacrum is removed as far as the pelvic floor, making easy access to the diseased cylinder and its adjacent parts. A collection of 102 cases operated upon in this way gives a mortality of 21.5 per cent., though Thorndyke's collection of cases gives a mortality of only 14.7 per cent. (Warren.[27])

The upper limit of the bone incision in all sacral

operations is explained lucidly in Dr. McCosh's paper, read before the New York Surgical Society April 13, 1892,[13] in which he says: "Division of the posterior branches of the sacral nerves is of little moment, as no important tissues are supplied by them. Division of the anterior branches of the fifth nerve is also unimportant. Division of the anterior branches of the fourth nerve, if confined to one side, is not followed by serious disturbance. Division of the anterior branches of the third nerve should be avoided, as they enter into the formation of the ischiatic plexus and serious changes in the innervation of the pelvic organs are liable to follow injury of either of these branches."

Bardenheuer's Method.—With the patient in the lithotomy position, the skin incision is practically the same as Kraske's, but the sacrum is cut transversely below the third sacral foramen and removed with the coccyx.

Heinecke's Method.[15]—Wishing to avoid whatever tendency toward weakening the pelvic floor which Kraske's method might bring about, Heinecke devised in 1888 a T-shaped incision in the skin, sawing the sacrum first vertically and then at the level of the fourth foramen transversely, thus making two folding bone doors. These are afterward united by suture.

Kocher Method.[16]—A long integumentary incision is made, freely exposing the bone. With a chisel each side of the sacrum is grooved along the inner side of the foramina, beginning at the third. The segment which is called the "*knochenspange,*" is removed. This exposes the sacral canal and makes certain the protection of the nerves.

These last two methods seem too complicated to have received general indorsement, yet the lateral blood-supply is maintained in both.

Levy,[17] in order to spare the fourth sacral nerve and the levator ani's coccyeal insertion, suggested an incision shaped like an inverted letter U, bending the osteoplastic arc toward the anus. But because of the limited space it offers, and the very imperfect drainage, it has seldom been used.

Hegar[18] carried the knife along the sides of the sacrum, making a letter V, and hinges the flap with a chain saw. Gerster claims good drainage in this method, but condemns it because of the impairment of the flaps' vitality.

Hochenegg[19] made a curved incision with the convexity to the right, commencing opposite the third foramen, extending outward and passing the middle line again below the last button of the coccyx. He based his report on thirty-two cases from Prof. Albert's clinic in Vienna.

Lange's[20] method of resection of the rectum with osteoplastic transplantation of the anal portion was brought to the attention of the profession at the meeting of the New York Surgical Society, January 14, 1891. Two patients were presented. In one a wide gap existed at the time of operation, between the proximal end of the intestine and the sphincters below, and it was to preserve the muscular power of the anus that led to the ingenious incision he then suggested. The knife was carried from each tuber ischii across the perineum in front of the sphincters. The incisions met in the raphe, and were made deep enough to allow of pushing the whole muscular apparatus of the anus upward, including the anal portion of the gut. Thus, in each case, fully three inches were gained and exact union of the gut with sutures to the sphincter was achieved. Dr. Lange recommends this operation where the sphincters can be preserved, and where the proximal end of the gut is not sufficiently movable to allow of its being pulled down to the anal ring.

Rehn (reported by Gerster) in 1890 described a series of successful cases in which a V-shaped incision was made, one leg of the V embracing the entire width of the sacrum below the third foramen, while the other passed along the left side of the sacrum and coccyx. This osteo-integumental lap when hinged exposes the diseased rectal cylinder in a most satisfactory way.

Zukerkandl, the Vienna anatomist, Borelias of Karlsbrona, and Wölfler, have reported modifications of Kraske's operation, each claiming special merit for his particular method.

Hartley[24] removed a cancerous mass complicating a rectosigmoidal intussusception according to a method suggested by Maunsell of Melbourne, Australia. The details of this method are unique and are described at length in the *New York Medical Journal,* October 22, 1892, also in Dennis' "System of Surgery," Vol. IV., p. 488.*

Dr. Howard A. Kelly describes the operation of drawing the proximal end of the sigmoid down into a slit which has been made in the closed rectal cylinder, clamping the traction sutures across the anus.

Dr. Charles K. Briddon[25] telescoped the proximal into the distal end of the gut in his classical case of complete, traumatic, transverse rupture of the rectum, and his patient made a good recovery.

Preliminary Colotomy.—This interesting subject can only be touched upon owing to the brevity of the time allotted to me. To those interested in this subject I would refer them to the scholarly articles by Dr Chas. K. Briddon in the *New York Medical Journal,* September 20, 1890, Dr. Robert F. Weir in the *Medical Record,* April 21, 1900, and more recently to Dr. Wm. J. Mayo's article in *American Medicine,* Vol. I., No. 3.

Dr. Briddon taught his students ten years ago that colotomy should precede proctectomy, and he almost invariably practised this teaching. Dr. Lewis S. Pilcher says, "preliminary colotomy is desirable in all cases; imperative when obstructive and ulcerative symptoms are marked." Dr. Wier writes that "the creation of a false anus is of increasing importance as a preliminary step in various operations on the rectum."

Bergmann[24] has not made a preliminary colotomy for some years. He claims that this opera-

* Maunsell's operation has recently been modified by Prof. Weir. The modification is a very ingenious one. Three cases are reported. MEDICAL NEWS, Vol. LXXIX. No. 4, p. 122, July, 1901.

tion does not ensure the emptying of the bowel. In 133 sacral operations by Hochenegg, reported by his assistant, Hanz Lorenz,[35] preliminary colotomy was done but four times. Notwithstanding the omission of this step in the preparatory treatment of the German surgeons, it is very frequently advocated and practised by American operators.

The operation is not entirely devoid of danger. Mayo lost his first case as a result of too much tension on the sigmoid, causing gangrene. However, it is so simple and safe in character that of itself it need not be considered as affecting the prognosis. It not only insures immediate relief of most of the distressing symptoms, the bleeding, the sacral pain, the tenesmus, thus permitting the patient to gather strength for the trying ordeal which is to follow, but it also insures the partial healing of the ulcer and diminishes the purulent discharge, to say nothing of the effective daily cleansing of the diseased tube which it allows in the preliminary treatment.

Report of Cases.—During the past year four cases of cancer of the rectum have come under my care. Two of these received operation and two were inoperable. Of the operated cases, in one a palliative colostomy for acute intestinal obstruction was done and in the second the Bardenhauer modification of Kraske's operation was employed.

Cases I. and II.—One from Triadelphia and the other from Bethany, W. Va., were admitted to my service in the City Hospital in Wheeling, suffering from inoperable carcinoma of the rectum. In neither case was it deemed wise to add the discomfort of an artificial anus; as there were no obstructive symptoms, moreover, this procedure could in no wise have checked the onward progress of the disease. Death came to the relief of both.

Case III.—Wm. B., aged sixty-seven years, living in Bridgeport, Ohio, I saw with Dr. Cole in April, 1900. Patient was suffering with symptoms of acute intestinal obstruction. He was admitted to the City Hospital, and under ether narcosis, in Trendelenburg position, a median incision revealed a cancerous mass, somewhat adherent, deeply situated and at the rectosigmoidal junction.

The critical condition of the man precluded the possibility of any prolonged plastic work. An inguinal colostomy was made. In five weeks the abdomen was opened a second time with the hope of doing a Maunsell operation, or some modification of it; but it was regretfully demonstrated that the case was entirely inoperable. The pelvic glands, mesentery and omentum were all matted together with cancerous adhesive infiltration. Recovery from the operation was satisfactory. The patient gained in flesh and strength, and at this writing, a year having passed, he is alive and fairly comfortable, with his artificial anus.

Case IV.—Carcinoma of the rectum, preliminary colostomy, excision of four inches of the gut, preservation of sphincter muscles, circular rectorraphy, complete recovery with restoration of sphincteric function. Mrs. K. F., aged 51 years, married, house-wife, no morbid family nor previous personal history. Increased difficulty and pain in effecting a bowel movement extending over six months, with the presence of blood, mucus and pus in the stools led to an examination November 11, 1900. There had been some tenesmus and the amount of blood lost was considerable; the dull wearing pain through the sacrum and bowel made her life a burden. There had been gradual loss of flesh and strength, and the cachexia early developed was now fastening itself upon her. The typical pipe-stem stools were in evidence.

The examination revealed an ulceration about one inch and a half from the sphincter, extending along the posterior wall of the rectum. This, an inch and a half higher up, merged into a funnel-shaped, irregular stricture entirely encircling the bowel. The unguinal phalanx passed with difficulty beyond the constriction, causing much pain and rather copious bleeding. The uterus could be made out above the cicatrical narrowing and there was healthy gut beyond this point.

Operation was honestly placed before the patient, with its many risks, the possibilities of relief, and prolongation of life or even of a permanent cure, and it was accepted. The patient was immediately placed upon preliminary treatment. Intermuscular inguinal colostomy was done December 5, 1900. The colon was easily recognized by its anatomical peculiarties, and brought into the wound. Traction was made in the direction of the descending colon, and continued until shortness of the mesocolon arrested further extension. This step in the technic is of the greatest importance, preventing beyond doubt procidentia through the newly-made anus.

The writer cannot agree with Wyeth, as reported by Mayo, when he says: "All of the movable sigmoid should be pushed upward, making the opening as near the rectum as possible." The sigmoid flexure may be the natural reservoir for fecal accumulation, but by placing it on the proximal side of the new anus, prolapse will most certainly occur in some cases. Having had one experience of this kind, the writer does not hesitate to place emphasis on this point, so well set forth in Dr. Pilcher's article.[37]

The protruding colon was withdrawn far enough to expose the mesocolon, and a supporting rod of glass about the thickness of a slate pencil was thrust through the mesentery. This clean rod at once created a spur, preventing the return of the gut and holding the parietal and visceral peritoneum in contact. No sutures were used. Three days later the bowel was opened with a Paquelin cautery. Irrigations of the colon and a cleansing toilet of the rectum were practised once or twice daily until the day of the sacral operation.

Operation was performed December 18, 1900; ether narcosis; Sims' position. An incision was made from the middle of the sacrum to the anus. The coccyx was removed and the sacrum divided

transversly just below the third sacral foramen with a chisel. The sphincters were divided, the rectum laid open posteriorly, a circular incision was made a half inch above the sphincter entirely around the gut, and the blunt dissection pushed forward. The liberation of the diseased tube was not difficult. The dissection was carried an inch and a half beyond the disease, and the gut excised just below the point of the peritoneal reflection. The cut segment of gut above was approximated to the short remaining portion below, with as little tension as possible, and a circular rectorrhaphy performed. The divided sphincters were restored by the use of iron-dyed silkwormgut. A loose packing of sterile gauze was placed in the wide gaping wound. No iodoform gauze was used. While the patient's condition was good all through the operation, thanks to the skilled administration of ether by Dr. Robert H. Bullard, soon after reaching her bed she exhibited symptoms of profound shock; the skin was cold and clammy, the respirations were shallow and sighing, and there was no radial pulse. It required the most active measures, including the submammary infiltration of two quarts of decinormal salt solution to keep the heart beating, in addition to other cardiac stimulation.*

The progress of the case after the first forty-eight hours was uninterrupted. Her temperature was never over 99° F., and, excepting one small opening back of the anus, less than one-quarter of an inch in diameter, the new rectum never departed from the sphincters to which it was sutured. The wound granulated kindly, there was absolutely no infection. The artificial anus did most excellent work, permitting the cleansing of the bowel in both directions. There never was the least tendency to prolapsus. February 22, 1901, the artificial anus was closed, according to the extraperitoneal method suggested by Grieg Smith.

The patient has almost perfect sphincteric control. She has gained in flesh and strength, has lost her cachexia, and to-day is entirely well.

Revision of the Statistics.—During the past year or so a very large number of statistical papers have appeared on the radical operation for rectal cancer, based chiefly on the work done in German clinics. The majority of the latter have reported their cases so that we have a very complete account of what is going on in this department. Unfortunately it is not as easy as would appear to obtain accurate figures as to the sacral route. Some authors include under this title resection of the coccyx and temporary resection of the sacrum, while others do not. Naturally the precise route is not always mentioned. Some reports deal separately with intervention involving the bone, while others include under sacral the parasacral operation in which the bony structures are not divided. Authorities have different ideas of operative mortality, some including all deaths which follow the operation, others only such deaths as are caused directly by the latter. Many favorable percentages are, of course, due to the selection of cases, so that to-day no figures have any value which do not give the total number of cases which come to consultation. It is almost a rule in statistics that the greater the percentage of cases submitted to operation, the higher will be the operative mortality. Some authors compare the number of cures with the number treated, others with the number operated upon radically, others again with the number who survive the operation. There are thus three distinct standards, and more or less confusion is bound to arise. When all these sources of error and misunderstanding are borne in mind it will be apparent that the collection of accurate statistics under such circumstances is a difficult procedure.

Early in 1900 Krönlein[28] of Zurich compiled the statistics of clinics which had already published their reports for a period of years. Eleven large clinics were presented, including his own. His table shows that the operative mortality in radical operations of all kinds, irrespective of route, averages 19.4 per cent. He analyzes the causes of death in 161 cases. In a third table he shows that the permanent cures based upon the number of operations averages 14.8 per cent. Krönlein gives no statistics of the sacral route; his tables are full of interest and are as follows:

TABLE I.

OPERATIVE MORTALITY IN RADICAL OPERATIONS OF ALL KINDS.

Operators.	Year.	Operations.	Deaths.	Per cent.
Kocher	1873–1899	35	10	28.5
König	1878–1890	96	31	32.5
Czerny	1878–1891	109	11	10.
Krönlein	1881–1899	63	7	11.1
Gussenbauer	1882–1896	145	33	22.7
Bergmann	1883–1888	46	5	11.3
Madelung and Garre	1883–1899	53	10	19.
Kraske	1885–1896	80	15	18.7
Küster	1885–1898	95	24	25.2
Hochenegg	1887–1897	93	8	8.6
Mickulicz	1890–1897	66	17	25.7
	Total	821	171	19.4

The joint results as to the cause of death are as follows:

Number of deaths, 171—sepsis and pyemia, 46; peritonitis, 37; heart-failure, collapse, 32; pulmonary affections, 21; miscellaneous, 35.

Krönlein next compiles a table of permanent results, the period to include all patients who have passed three full years without any recurrence of the disease.

TABLE II.

PERMANENT RESULTS.

Operators.	Operations.	Cures.	Per cent.
Kocher	35	10	28.5
Czerny	109	16	14.6
Krönlein	63	10	16.
Bergmann	46	8	17.4
Madelung and Garre	53	6	11.3
Kraske	80	11	13.7
Küster	95	16	16.8
Hochenegg	93	12	12.9
Mikulicz	66	6	9.

Average percentage of cures, 14.8.

*The author desires to express his appreciation of the skilful services of Drs. J. Schwinn, Andrew Wilson and Wm. H. McLain and of the valuable pathological work of Dr. Wilson.

Aside from the foregoing, although three years' immunity is usually considered a cure, a number of late relapses have been recorded, as follows: Kocher, 3; Krönlein, 2; Kraske, 3; Hochenegg, 1; Mikulicz, 2; Madelung and Garre, 2; making a total of 13.

The general results, then, are as follows: Died from operation, 19.4 per cent.; permanently cured, 14.8 per cent.; balance, 65.8 per cent.

As to incontinence: Absolute continence, 30 per cent.; relative continence, 60 per cent.; incontinence, 10 per cent. These figures are based on the analysis of 39 personal cases of Krönlein.

Walter Christen, assistant to the Zurich surgeon, issued a paper at about the same time Krönlein's appeared.[29] Christen's paper deals entirely with Krönlein's personal cases, private and public. Out of 46 cases seen 24 received radical operation and of this number there were two deaths, a mortality of 8.3 per cent. Fifteen patients underwent relapse sooner or later. The 15 cases of relapse averaged twenty-seven months of life, while the non-operated cases averaged but eight months.

About the same time there was published by F. Schneider[30] the statistics of the Rostock clinic representing the work of Madelung and Garre. One hundred and fifteen patients applied for treatment for rectal cancer from 1883 to 1899; of this number 53, or 47.2 per cent., were subjected to radical intervention. Kraske's operation was done fourteen times, resection of the coccyx alone twelve times, and temporary resection of sacrum by Schlange's method four times, making a total of 30 bone operations, with an operative mortality of 25 per cent. Only two survivors passed the three-year limit; one is still well, while the other had a relapse after six years.

Up to this time we find no satisfactory statistics of the sacral operation. Early in 1900 Josef Pichler, assistant of the Vienna surgeon, Prof. Hochenegg,[31] collected for the first time all of the sacral cases he could locate, in which the operators had a series of operations to their credit, including a small number of miscellaneous operations once collected by Frank.

TABLE III.

PICHLER'S TABLE OF SACRAL OPERATIONS.

Source.	Cases.	Deaths.	Per cent.
Czerny	36	7	19.1
Krönlein	1	1	
Mikulicz	57	14	24.5
Frank (miscellaneous)	39	7	17.9
Vienna Hospitals	83	13	15.6
Billroth Klinik	56	10	20.4
Gussenbauer	15	4	26.6
Klausner	5	0	0.
Kraske	66	5	7.5
Paul	19	4	21.
Swinford	14	2	14.
Regnis	4	1	
Küster	46	7	15.2
Hochenegg	119	6	5.04
Total	563	81	15.

The Rostock cases reported by Schneider which would increase the number to nearly 600, are not included in this table. It might be well to mention as a comparison a collection of 217 cases of perineal operation from the statistics of Czerny, Kocher, Krönlien, König, Mikulicz and Gussenbauer, containing 37 fatalities, or 17 per cent.

Hochenegg's 119 sacral cases are carefully tabulated in Pichler's article, and of this number 29 were living three years after intervention. Of the 40 out of the 119 cases known to have relapsed, the average duration of life was 21.4 months.

Upon the appearance of Pichler's paper, Prutz of Königsberg, assistant to Von Eiselburg, attacked[32] the statistics and revised them or edited them in such a way that he made the operative mortality 21 per cent. instead of 15 per cent. for the sacral method. Prutz includes all deaths indirectly due to operation, while Pichler takes the direct deaths only. Soon after this controversy Prutz wrote a second paper,[33] which was a study of Von Eiselburg's cases of rectal cancer and these are not included in any of the preceding tables. During the years 1896-1901, 75 cases of cancer of the rectum came to the Königsberg clinic for treatment; the proportion of men to women was 10 to 7. Forty-five cases underwent operation, or 3 out of every 5, and 38 of this number were sacral cases. The operator lost 5 of his 45 cases, making a mortality of 11.1 per cent.

It will be seen that in Krönlein's table Bergmann's statistics extend only to 1888, while Pichler's sacral table contains no reference to Bergmann. After the preceding papers had called attention to the matter Heinrich Wolff, assistant to Von Bergmann of Berlin,[34] published all of the latter's material from 1888 to date. The total number of cases seen was 155, of which 125, or 80.6 per cent., were subjected to radical intervention, while 30 were treated by palliative measures.

Amputations: Extirpation of coccyx alone, 21 cases; extirpation of coccyx with partial restriction of sacrum, 8 cases; no bone operation 17 cases; data wanting, 14 cases. The operative mortality in 60 amputations was 9, or 14.7 per cent. Of 39 survivors followed up 12 are still living. Of 65 resections only two were operated upon by other than the sacral method, and in these two an abdominal section was performed. Of the whole number of resections, 31 died as a result of operation, 47.7 per cent., and of 34 survivors 28 were followed up, and of this number 8 are still alive.

Combined statistics: In 125 operations there were 40 deaths, 32 per cent. mortality. One-half of these patients died from collapse, narcosis, hemorrhage and shock. Permanent cures from both operations, 27.7 per cent.

Wolff points out that any attempt made to demonstrate the excellence of highly-individualized methods of operating have a tendency to injure statistics by making comparisons difficult. Another fallacy is found in the selection of only simple cases for operation, which naturally gives

a low primary mortality. As a result of his study of statistics he notes the great discrepancy in the results adduced and seeks to explain them on one of two grounds, namely, the fixation of the indication *before* operation or the fixation of the indication *during* operation.

The author is able to demonstrate his points from two sets of statistics in Bergmann's clinic. The first series runs from 1883 to 1888 and has a primary mortality of 11.3 per cent.; the second series extends over the period 1888 to 1900, with an operative death-rate of 32 per cent. These results were obtained in one and the same clinic, and by the same operator. We can therefore do away with matters of personal equation, such as differences in technic and of material seeking operation.

To explain such wide discrepancies, however, there must be some reason. The modern methods of wound treatment may have its weight, or the indications for interference may have undergone change. Certainly the results obtained during the second statistical periods were three times as bad as during the earlier epoch. Why? The chief explanation which can avail here is that the surgeon, in later years, began to operate on cases which he had previously regarded as inoperable. But this course of reasoning does not exhaust all the possibilities. Examination during narcosis, a step, by the way, which should never be omitted, may also exert a strong influence on the issue of the case. The revelation of extensive adhesions or glandular involvement must often cause the operator to change his original plans, if he has his patient's interest at heart. Two courses are open to him: First, he may abandon further intervention, may change a would-be radical to a palliative procedure, thereby saving the sufferer from operative death, while placing him in line for certain relapse, and thus obviously benefiting statistics. The second course is the extremely radical one, the extirpation of the infected ganglia and adhesions, placing the patient's life in extreme jeopardy—this same patient who would have been satisfied had the operation been abandoned and would have lived to thank the operator.

For many years Von Bergmann has advocated and used the sacral method for cancer high up in the rectum, and he has also used the modification known as the Schlange osteoplastic operation. While this latter modification gives better access to the tumor than any other method, it is undeniably formidable and is attended with excessive hemorrhage and shock.

Amputation of the rectum is attended by considerably less danger than is resection; so much so that statistics of the two operations should be kept separate. Amputation is less bloody and requires less time. Opening the peritoneum is no longer regarded as a momentous complication. Most operators will share this opinion with Wolff, yet it should be avoided, particularly in resection cases in which a preliminary colostomy has not been done. Wolff speaks of the importance of eight or ten days of preparatory treatment, or even more. Only liquid nourishment is allowed during this period, and stools are secured regularly by the use of castor oil and enemata of water. Hochenegg and Lorenz[35] express the very opposite opinion, claiming it is difficult to empty the bowel when a stricture of the gut exists. The fluid dejecta produced by purgatives may do more harm in premature defecation than if the feces are scybalous. The Vienna surgeon has therefore abandoned purgatives on this account.

In the treatment of the wound surface Bergmann abstains from a primary suture and relies upon tampons of iodoform gauze. In a certain number of cases Wolff describes a delirium which followed the operation, lasting two or three days or as many weeks. This was thought to be due in a measure to iodoform toxemia and simple sterile gauze was used in its stead in a series of cases. Nevertheless the delirium still appeared with some frequency. According to some authorities, this delirium is apt to follow rectal operations, which perhaps justifies the belief that the phenomenon is due in some way to the bacillus coli. In this connection it will be well to mention that the liberal use of iodoform gauze in large gaping wounds of the kind under consideration is undoubtedly pernicious. Sterile gauze will answer the same purpose and its use is attended with no danger.

One word regarding the *"durchzeit"* operation recently described by Hans Lorenz.[35] Of the 133 sacral operations performed in Hochenegg's clinic, bringing this operator's work up to February, 1901, there were 90 amputations, 25 resections and 17 of the so-called *"durchzeit"* operations. This latter method, devised by Hochenegg seeks to substitute for reuniting the intestine a suture of the bowel to the lips of the skin.

The mortality of the three forms of operation is as follows: Ninety amputations with 13 deaths, of which 8 were from wound infection; 25 resections with three deaths, all from wound infection; 17 *"durchzeit"* operations with one death from wound infection. In all cases in which the sphincter is left intact after excision of the rectum, and in which it is possible to mobilize the proximal end of the gut without serious tension to the sphincter, Hochenegg adopts this method. He denudes the mucosa and inverts the anal portion, then brings down the proximal gut and sutures it to the external skin.

The functional result following the *"durchzeit"* operation is interesting and is shown in the subjoined table.

TABLE IV.

Result.	Durchziet Method.	Resection.
Complete Continence.....	47 1-17	36 4-11
Partial Continence.....	29 7-17	27 3-11
Incontinence.....	23 9-17	36 4-11

The latest clinic to make a complete report of its work is that of Schedé of Bonn, reported by Carl Vogel[36] in April, 1901. Shedé has performed 22 sacral operations with 10 deaths, while

TABLE V.

VOGEL'S MODIFICATION OF KRÖNLEIN'S TABLE I. BROUGHT UP TO FEBRUARY, 1901.

Operator.	Mumber treated.	Radical Operation.	Mortality.
König	120	78.3 per cent.	32.5
Czerny	151	71.1 "	20.
Krönlein	110	57.2 "	11.1
Gussenbauer	259	56. "	22.7
Von Bergmann	155	80. "	32.
Madelung and Garre	115	46. "	19.
Kraske	110	73. "	18.7
Küster	126	75.4 "	25.2
Hochenegg	141	66. "	8.6
Mikulicz	109	66. "	25.7
Helfenit	46	48. "	13.6
Schedé	66	80.3 "	32.
Total	1508	66	20.

his percentage of recoveries is 25 per cent. Vogel concludes his paper with the following interesting table, modifying Krönlein Table I. by additions.

SUMMARY OF SACRAL OPERATIONS.

	Cases.	Deaths.	Per cent.
Pichler	563	81	15
Prutz (revision of Pichler's)	542	115	21

Since the controversy over these statistics the following have appeared:

Rostock Clinic	32	8	25
Von Eiselberg	38	?	?
Von Bergmann	92	?	about 45
Hochenegg (up to Feb. 1901.)	14		
Schedé	22	10	45
	198		

These cases add nearly 200 more sacral operations to the material collected by Pichler, or a total of 761 sacral operations for cancer of the rectum for Germany, Austria, and Switzerland, with a few in the British Islands, with an operative mortality of about 18 per cent.

BIBLIOGRAPHY.

[1] Gerrish's Anatomy, p. 732.
[2] Treves, Applied Anatomy, p. 373.
[3] Dublin Hospital Reports, Vol. V., p. 158.
[4] Gant, Diseases of Rectum and Anus.
[5] St. Bartholomew Hospital Reports, Vol. XII., 1876.
[6] Annals of Surgery, Vol. XX., 1894, p, 2.
[7] Surgery of the Alimentary Canal, p. 337, 1900.
[8] Erichsen's Science and Art of Surgery, 1885, Vol. II., p. 843.
[9] Annals of Surgery, Vol. XXII., 1895. p. 485.
[10] Druit's Vade Mecum, 1887, p, 738.
[11] Gerster's Report, *ibid.*
[12] Archiv. für klinische Chirurgie, Vol. XXXIII., p. 563, 1885.
[13] New York Med. Jour., Sept. 3, 1892.
[14] Sammlung klin. Vorträge, No. 298.
[15] Münchener med. Wochenschrift, 1888, No. 37.
[16] Reported by Arnold (McCosh, *ibid.*)
[17] Levy, Zur Technick der Mastdarmresection. Centralblatt für Chir., 1889. No. 13.
[18] Gerster's Report, Von Beck's Inaugural Dissertation, Freiburg, 1889.
[19] Wiener klin. Wochenschrift, 1889. No. 36.
[20] New York Medical Journal, Vol. LIII., p. 300.
[21] Treves, Operative Surgery, p. 691 (McCosh).
[22] British Medical Journal, 1889, p. 806.
[23] Surgery of the Alimentary Canal, 1900. p. 462.
[24] New York Medical Journal, Oct. 22, 1892.
[25] New York Medical Journal, Vol. LIV., p. 564.
[26] Dennis, Vol. IV., p. 457.
[27] Surgical Pathology, Warren, 1895. p. 690-693.
[28] Arch. für klin. Chir., LXI., 1900, p. 309.
[29] Beiträge zur klin. Chir., XXVII., 1900 p. 411.
[30] Beiträge zur klin. Chir., XXVI., 1900. p. 405.
[31] Arch. für klin. Chir., LXI., 1900, p. 229.
[32] Arch. für klin. Chir., LXII., 1900, p. 398
[33] Arch. für klin. Chir., LXIII., 1900, p. 598.
[34] Arch. für klin. Chir., LXIII., 1900, p. 232.
[35] Arch. für klin. Chir., LXIII., 1901, No. 4.
[36] Deutsch. Zeitschr. für Chirurg., April, 1901.
[37] Dennis, Vol. IV., p. 495.

THE PROBLEMS OF PHYSIOLOGY AND PATHOLOGY.[1]

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THE problem that most interests scientific medicine to-day is the nature of life phenomena. The methods of work and reasoning which the past has applied to the solution of this problem have failed of that complete explanation which we crave. It seems evident, if we interpret the signs of the times correctly, that medicine is undergoing a radical change and that it is approaching its great problem from another standpoint than that of the past. Within the last few years physics and chemistry have made advances of a most signal nature, and it is to the application of these newly-learned truths to the problems of medicine that we must attribute the changes that modern medicine has undergone. Indeed, to bring medicine under the rigid laws of physics and chemistry seems to offer the only hope of establishing it as a science, and of depriving it of those characteristics which have led some men, alas, to call it an art. Deeply hidden as seems to be this essence of organic nature—life, our craving for the knowledge of the unknown will give us no peace until we have found it. How near at hand or how distant the solution of this problem may be is not for us to say. Every day brings some new fact to light that carries us a little nearer to the solution of our world enigma, and so long as this continues man will not cease in his endeavor to know still more.

In the following pages I have collected a few of the facts which show what the present is contributing to the solution of our problem. I have confined myself to the fields of physiology and pathology, and it has been my object to show where it is possible that the answers to some of our questions lie.

For years men have toiled in the department of anatomy and by description and drawing have given us an insight into the architecture of the body. With the invention of the microscope, and

[1] An address delivered to the graduating class of Rush Medical College, Chicago, June 20, 1901.

the development of the cellular hypothesis, our knowledge in this direction has been much refined, and with modern facilities this knowledge has become so widespread that every student of medicine has in his possession a clear picture of the machine with which he has to deal. This has helped much in the elucidation of life phenomena. Pathology, of much more recent date, has had the same developmental history. Just as we have had a cellular physiology we have had a cellular pathology. But morphology has its limits and description and illustration have an end. The close of the last century has perhaps seen the last of the great contributions that morphology can make to medicine. Much as this morphology has added to the knowledge of the structure of our machine, it has given us but little insight into the forces that operate it. And so it is that we have been driven to look to that which lies behind structure, to a consideration of the composition of the substances that go to make up the outward form. We have been forced to abandon the fields of morphology and to enter the domain of chemistry.

But let me not be misunderstood. The necropsy theater has been the means of linking together signs and symptoms with definite pathological lesions. The accuracy of our present medical diagnosis is but the expression of careful clinical study followed by patient postmortem investigation. The value of histological pathology, too, in its bearing upon clinical medicine can never be overrated. The microscope has been and must ever remain one of our most trustworthy aids in the diagnosis of many obscure pathological conditions. But the diagnosis of diseased conditions is not the ultimate object of medicine; medicine would do more than this —it would control the forces of which pathological lesions are but the outward expression. Clearly morphology can render us little service in this direction. My remarks have reference to the future in pathological research.

* * *

The physiologist's problem of to-day is the determination of the constitution of living matter; the pathologist's problem, the constitution of living matter in its perverted state. For years physiological chemistry has busied itself with a study of the chemical processes that go on within the living organism. It has studied the substances necessary for the metabolism of the animal tissues and the end-products of this metabolism; it has studied the ingesta and the egesta of animal economy. The same statement holds for pathological chemistry. Only recently has the question been asked, "What happens between the beginning and the end of metabolism?" And it is just here, in this study of what we might call dynamic chemistry, that the solution of so many problems in physiology and pathology lies.

It is now about fifteen years since physical chemistry—the science which would point out the relation between the physical properties of a substance and its chemical constitution, the science that deals with the dynamics of chemistry—was established as an independent science. Time does not permit me even to mention the rich results that this new science has already yielded, and the purpose that it has served in the elucidation of many obscure chemical and physical facts. What is thus far one of its greatest developments, the theory of electrolytic dissociation, has in itself served to correlate a mass of heterogenous facts which seemed to bear no relation whatsoever to each other. What the possibilities are that lie in the application of this theory to the problems of physiology and pathology may be imagined after a brief recital of a few of the facts that such work has already yielded.

When the gastrocnemii of frogs are immersed in equimolecular salt solutions, it is found that the amount of water absorbed by them depends upon the nature of the solution in which they are immersed. In solutions of sodium or lithium salts the muscles gain but little in weight; in equimolecular potassium salt solutions the increase in weight is enormous; in the equimolecular solutions of a calcium salt the muscle loses water. Furthermore, the coagulation of albumin by heat is intimately associated with the presence of inorganic salts. Experiments with equimolecular salt solutions show that the point of coagulation of a salt-albumin mixture varies with the nature of the salt employed. These and other facts seem to indicate that the various salts in the body probably stand in definite combination with the proteids as ion proteid compounds. It is possible to substitute one class of ions for another, and so alter the chemical and physical properties of the proteid molecule. With alterations in physical structure come alterations in function. To supply an organism with only one salt is to destroy its function. Thus, even common salt, sodium chloride, which permeates all our tissues, in pure solution acts as a poison, since it supplies the organism with only one kind of metallic ions.

The riddle of the heart beat, too, has been brought a step nearer solution. It has been definitely proved that the rhythmic activity of the heart is dependent upon the presence of certain salts in the blood. The heart cannot beat except in the presence of sodium ions in the circulation, but sodium ions alone act as a poison and soon bring the heart to a standstill. The presence of certain other, for example, calcium ions, however, neutralizes the poisonous effects of the sodium ions. Indeed, in a mixture of these two salts heart muscle will beat rhythmically for hours. Any of the voluntary muscles can be made to contract rhythmically just as heart muscle by the simple abstraction of a little calcium from the mixture of these salts. It is a slight excess of calcium in our blood that keeps the voluntary muscles of our bodies from contracting rhythmically. These facts are interesting in another direction; they show that in this case chemical and not morphological differences underlie variations in function.

In the physiology of taste, the theory of ionization has also correlated many heterogeneous facts. Acids taste sour because they contain hydrogen ions; the characteristic taste of hydroxides is due to their hydroxyl ions. With inorganic compounds the intensity of the taste is directly proportional to the number of ions that the solution contains. With organic salts, however, this law does not hold. The halogens have a salty taste due to the halogen ions. Sodium, potassium, magnesium, lithium, and other metallic ions each have an individual taste. Thus the taste of a given salt is dependent upon the nature of the ions that constitute its molecule.

The application of the theory of electrolytic dissociation to the action of germicidal solutions has forever laid to rest the old idea that the action of a mercurial is dependent upon the amount of mercury contained in solution, and is independent of the nature of the compound. The germicidal action of a mercurial is dependent upon the number of mercury ions in solution, and since among the mercurials the bichloride dissociates most readily when dissolved in water, it has the strongest antiseptic action. That it is, indeed, the mercury ions that are the efficient agents in the destruction of bacteria is proved by the fact that the solution of a mercury salt in alcohol—a substance in which no electrolytic dissociation occurs—has no germicidal properties. The same reasoning is applicable to the salts of silver, gold, zinc, copper, and the other metals.

Pathologists have in years past sought the explanation of the edema which occurs in some pathological processes either in an increased blood-pressure, or in changes in the permeability of the vessel-walls, which under normal or increased blood-pressure permit the blood serum to filter through. Thus the cells concerned in the edematous process have been considered to play only a passive rôle. There are facts, however, that go to show that the cells play an active part in the pathological process. I have already referred to the experiments which show that the differences in the constitution of protoplasm which follow its immersion in various equimolecular salt solutions lead to differences in its ability to absorb water. It is not impossible that the conditions which give rise to the edema may in reality so disturb the normal metabolism (through lack of oxygen or altered processes of fermentation) as to lead to an increase in the number of molecules in the cell, or to changes in the chemical constitution of the protoplasm. This places the cell in a position to absorb water from the blood or lymph. Thus an edema of the affected cells results.

The mechanical notion that a cell may be considered a semipermeable membrane enclosing protoplasm has been much neglected. It has been known for many years that certain vegetable cells, when placed in water or in a solution of less concentration than that contained in the cells, swell up and burst. To van t'Hoff belongs the credit of having pointed out that in this case we are dealing with differences in osmotic pressure between the cell-contents and the surrounding fluid. The semipermeable membrane separating the two fluids is found in the layer of protoplasm which lies close to the inner side of the cell-wall. This mechanical conception of the cell and its bearing upon osmotic phenomena is not to be lost sight of when we look for the explanation of life phenomena along purely chemical and physical lines.

Another field that promises great contributions to physiology and pathology is the study of enzyme activity. Enzymes are characteristic of all life phenomena, pathological as well as physiological With the ordinary properties of enzymes, their ability to produce change in other substances without undergoing change themselves, their power to bring about this change independently of the amount of the ferment employed, their destructibility by heat, most students of science are familiar. Recently it has been found that the action of certain enzymes is reversible. This gives the enzymes an entirely new rôle in the explanation of life phenomena, for they can no longer be considered as substances which have to do only with the breaking down, but also with the building up of complex molecules.

Lipase (steapsin) the fat-splitting enzyme of the pancreatic juice has the power not only of dissociating a fat into its fatty acid and alcohol, but also of building up fat from a mixture of fatty acid and alcohol. Which of these two functions it is that lipase manifests is dependent upon the relative proportions of fat and the products of dissociation that are present; in other words, lipase establishes a chemical equilibrium between the fat, and the fatty acid and alcohol. Outside of the body, fat is digested by lipase only to a certain extent if the products of enzyme activity are not removed. This is because a state of equilibrium is reached between the molecules of fat and the products of its dissociation. If, as in the intestine, the fatty acid and alcohol are removed as soon as formed, the fat-splitting ferment continues its action until all the fat is digested. Of what significance, now, is the reversibility of this enzyme action? Simply this. The presence of lipase has been demonstrated in the various regions of the body where fat deposits are found. As the fatty acid (this circulates in combination with the salts of the blood as a soap) and the alcohol come into contact with the enzyme of the cells, since there is now an excess of the fatty acid and alcohol, the enzyme activity is reversed, and fat is deposited. The fat absorption which occurs in starvation is also readily explained by the reversibility of the fermentative action of lipase. In starvation the fatty acid and glycerin of the cells diffuse into the blood. In consequence the equilibrium existing within the cells between these substances and the fat is disturbed. This causes the lipase to reverse its action, and where its presence once led to the building up of fat, it now leads to fat destruction.

The action of maltase, a ferment found in the

saliva, is also reversible, for not only can this enzyme split up a molecule of maltose into two of glucose, but it can build up two molecules of glucose into one maltose. Which of these takes place is simply a matter of equilibrium, for in the presence of an excess of maltose the enzyme forms glucose; in the presence of an excess of glucose the enzyme forms maltose. It is possible that the action of the proteolytic enzymes is also reversible. If this be true then the long debated question of how the body is able to build up proteids out of the products of proteid digestion is at an end.

Physiologists have long been troubled to explain the relation of the breaking-down processes which occur in digestion to the building-up processes which go on in the tissues. The reversibility of the action of enzymes shows how it is possible to build up complex molecules from the simple molecules which are the products of digestion. This makes the changes in digestion and tissue metabolism the same.

* * *

It would scarcely seem necessary in the present state of scientific development to speak a word against the "vitalistic" tendencies of certain classes of scientific workers. One would think that the search for causality would prevent scientific men from having recourse to the teleological in the explanation of life phenomena. Allowing for the moment that the position of these observers is the correct one, we, in our attempt to solve the problems about us, can never admit it. Such views lead only to scientific stagnation. To say that "Nature" is responsible for the hypertrophy of the blacksmith's arm, or that "Nature" causes the hypertrophy of the heart in a pregnant woman, illy answers our ever-pertinent question, "Why?" We are inclined rather to look for the explanation of these phenomena in the altered metabolism of the muscular structures. It is not "Nature" that causes the caterpillar to go up the tree in search of food; it is the animal's response to light (heliotropism), a response as definite when dry branches and death await the animal's arrival at the top, as when young shoots and life crown its efforts.

Let us pause for a moment to ask ourselves whence the assumption of a vital force comes. The old philosophers and physicians found all life phenomena intimately associated with a "spirit of life." Hippocrates, Erasistratus, Democritus and Galen could explain locomotion, respiration, speech, and the beat of the heart only through the existence of their *pneuma*. This philosophy continued until the fifteenth century, when, with the discovery by Harvey of the circulation of the blood, the superstitions that had for so many centuries enveloped the manifestations of what we term "life" received a severe rebuke. The circulation of the blood, together with the study of respiration, seemed to make possible the explanation of at least some life phenomena upon purely mechanical grounds. Deeper studies into the interchange between oxygen and carbon dioxide, and studies into the phenomena of digestion showed that other life processes are explainable upon a purely chemical basis. On the other hand, a great number of physiological processes continued to baffle the human mind. The physiologist Haller, who in his *Elementa Physiologiæ* first collected the discoveries in physiology that followed Harvey's work, failed to see how the "sensibility" of nerve or the "irritability" of muscle could be explained upon any other ground than the assumption of a specific *vis vitalis*. Still more baffling were the phenomena of reproduction and mental activity—two processes so obscure and so enveloped in mystery that a purely mechanical explanation of them seemed impossible. It was thus that a complete dualism in physiology sprang up, for while the explanation of some life phenomena upon a purely chemical and physical basis seemed possible, that of others was possible only upon the assumption of a vital force. These views were, however, but little better than the superstitions that had so blinded the progress of science before the days of Harvey.

It is to Helmholtz, Ludwig, Brücke, and others that we must give the credit of being the first to rebel against the vitalistic explanation of life processes. These thinkers showed that most of the phenomena that occur in the human organism take place in accordance with simple physical and chemical laws. I need not here recite the progress in physiology and pathology that the last half century has yielded. We no longer call upon a vital force in the explanation of the gross manifestations of life. Modern vitalists become so only when the functions of the individual cell are concerned. Modern dualism is the dualism of centuries ago, only with the advance of the ages it has undergone a refining process. Let it be noted that vitalism begins in every case where definite knowledge ends. Ignorance of the common laws of physics and chemistry made vitalists of the ancients; while our temporary ignorance of the physics of the colloidal solutions, and of the complex chemistry of the proteid molecule, makes vitalists of some physiologists and pathologists of to-day.

Each year brings new facts to light that contribute to the explanation of normal and abnormal life processes upon purely physical and chemical grounds, while they correspondingly detract from the value of all vitalistic explanations. Mental activity is no longer considered the expression of a disembodied spirit, and modern students of physiology cannot conceive of a mental act which has not its organic basis. psychology is an experimental science and as such is fast taking its proper place as a subbranch of physiology.

Enzyme activity which underlies all life processes is also associated with naught that is vital. The famous controversy between Pasteur and Liebig as to the vital principle concerned in fermentation is forever at an end. We now know that the enzyme activity of various organisms is dependent upon the presence within them of cer-

tain chemical substances that can be extracted from the dead calls, and which when added to fermentable substances produce chemical changes in them in just as typical a way as the organisms themselves. Zymase, the enzyme contained in yeast cells, is just as capable of splitting sugar into carbon dioxide and alcohol as the yeast cells themselves. In our own cells the processes of oxidation, so essential to and so characteristic of life, are dependent upon certain enzymes. But there is nothing living or vital about them, for they can be extracted from dead, even from alcohol-preserved tissues, and will when added to certain substances oxidize them in as characteristic a way as ever oxidation occurred in the living animal itself.

It may not be out of place for me to digress a moment in order to cite an experiment which shows how the action of these oxidizing ferments may be mimicked in the laboratory. It is possible with proper laboratory facilities to suspend finely-divided metallic platinum in water. This colloidal solution is capable of reducing hydrogen peroxide in just as characteristic a way as are the ferments derived from organic sources. The addition of hydrocyanic acid to these oxidizing ferments inhibits their action. In the same way the addition of hydrocyanic acid to the colloidal solution of platinum inhibits its power of decomposing the peroxide of hydrogen. Thus we have the paradox of being able to poison or "kill" a dead substance.

The phenomenon of reproduction, too, has been deprived of its vitalistic nature. The last two years have shown that a slight abstraction of water from the eggs of certain marine animals causes them to develop into living, swimming embryos without the intervention of the spermatozoon. Residence for a few hours in a concentrated solution of sugar, urea, glycerin, or any one of several salts brings about the necessary abstraction of water from the unfertilized eggs, which when returned to sea-water develop parthenogenetically. In some varieties of marine life the fertilizing function of the spermatozoon is replaceable by the addition of certain ions to the sea water. A few drops of acid, or the addition of a small amount of any potassium salt causes the development of embryos from the unfertilized eggs of the sea-worm *Chætopterus*. Thus is done away with the specific "life-giving" power of the spermatozoon. The development of embryos from unfertilized eggs which under ordinary circumstances cannot develop without the intervention of the spermatozoon breaks down another barrier to the explanation of life phenomena upon a purely physical and chemical basis. These experiments serve to show the weakness of the vitalist's position. The scientific worker of to-day must consider life as the expression of certain chemical changes that occur in the organism. Never can he consider chemical change as the expression of the specific "life" residing within the cell.

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I believe that the few facts which I have brought to your notice this afternoon suffice to show that the progress of science toward the solution of our world problem, life and its manifestations, lies along chemical and physical lines. It is my firm belief that with the close of the nineteenth century the curtain has practically fallen upon cellular physiology and cellular pathology. The new century has to busy itself with a *molecular physiology* and a *molecular pathology*. Physical chemistry will serve no small purpose in solving the problems that confront us. The study of enzymes, too, will answer some of our questions. It is essential that we lay aside our tendencies toward vitalism. Vitalism is an unknown equation and serves only as a cloak for our ignorance. The argument that we are unable to explain all life processes by simple physical and chemical laws and that in consequence we must assume a "vital force" is as indicative of ignorance as it is of weakness. Let it not be forgotten that chemistry and physics have not yet solved their last problems. Until recently physicists have considered all matter to be composed of atoms and molecules. Physical chemistry has added a third form of matter, the electrically charged atoms and groups of atoms called "ions." A fourth form of matter, the "electrons," dates from the discovery of the Roentgen rays. In the face of the fact that the physicist has not yet determined the constitution of matter, it is irrational to expect the physiologist to be acquainted with the constitution of living matter. Time will solve all problems. In the meantime let us cultivate our demand for causality, and let us be satisfied with no explanation save that of experimental proof.

INTRATRACHEAL INJECTIONS IN BRONCHIAL AND PULMONARY AFFECTIONS.

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THE inaccessibility of the lower respiratory tract and the belief that these membranes are too sensitive for local medication have necessitated that the local treatment of this region be largely by internal medication. Sprays are of value in the larynx and trachea, but do not reach the bronchi. Vapors and nebulæ penetrate the smaller bronchial tubes under favorable conditions, but the amount of the drug reaching the diseased part is so small that little benefit results.

Horace Green of New York is credited with being the first to use intratracheal medication. As early as 1838, he made applications of nitrate of silver to the trachea by passing a sponge saturated with the solution. He reported excellent results, but his treatment was considered too heroic to meet with general favor. The next step was the introduction of liquids into the trachea by means of a suitably-constructed syringe.

While this was practicable, and in skilled hands easily accomplished, the procedure was condemned by many, as the solution caused considerable irritation and coughing. Watery solutions with or without glycerin, and even mucilaginous solutions were found irritating. This method has met with greater success in the last few years, since it has been found that oily solutions of suitably-selected drugs are not irritating.

The writer believes that this method of treatment offers a valuable means of relieving many bronchial and pulmonary affections not readily amenable to ordinary medication. It seems rational that the same beneficial results which we are accustomed to get in treating mucous membranes generally should follow local medication of the trachea and bronchi. That this is true is amply proved by the systematic use of this method.

It is interesting in this connection to consider whether the normal mucous membrane of the respiratory tract is free from micro-organisms in health. Experimental observations, both in men and animals, indicate that the mucous membrane of the trachea and bronchi are sterile, or nearly so, and that the normal mucus of the bronchi, as of the nose, does not offer a suitable medium for bacterial growth. While such is the condition in health, in disease, micro-organisms of great variety and abundance are constantly found in the bronchi. Even in acute bronchitis micro-organisms have been found in abundance, and Ritchie from his experimental studies considers that this disease is infective, although not due to any single, specific organism. The organisms most commonly found were the diplococcus pneumoniæ and the streptococcus. The influenza bacillus appears to be frequently found in acute bronchitis even apart from epidemic influenza. Besides the above mentioned organisms, a number of others have been found occasionally. In chronic bronchitis and bronchiectasis, organisms are constantly found in the sputum.

In pulmonary tuberculosis, as long as the tubercle, with its specific germ, is alone present in the lungs, we have a condition which usually develops slowly. The patient has a hacking cough, slight fever, little expectoration, and few, if any toxic symptoms. If, however, the consolidated area becomes the seat of infection with organisms, such as the streptococcus or the staphylococcus, a different picture presents itself. The patient then gives distinct evidences of septic infection, high fever, night-sweats, abundant mucopurulent expectoration and breaking-down of the consolidated area. It is this secondary infection that adds so much to the gravity of the disease and is a condition difficult to combat.

It is possible by intratracheal injections to medicate the entire bronchial tree, and, by absorption through the lymphatics, to reach all portions of the lungs. Experimentally, it has been found that pigments are readily taken up by the pulmonary lymphatics, and, in man, we are all familiar with the mottled condition of the lungs, due to absorption of carbonaceous particles. By the intratracheal method from one to two drams of a menthol-guaiacol solution in oil can be introduced directly into the trachea without much discomfort to the patients. They can feel the solution in the bronchial tubes and the odor of the drugs can be detected in their breath for hours after the treatment. Some have said that they could taste the drugs in the expired breath for twenty-four hours after its introduction, indicating that the effect is more than a transient one.

In the congestive stage of acute bronchitis, the limited experience of the writer with this method of treatment would show that it is not adapted to this stage. It causes considerable irritation and possesses no advantage over the methods commonly in vogue. In the later stages of an acute attack where considerable thick, tenacious mucus is secreted, marked benefit will result from intratracheal medication. In chronic bronchitis it is of special value. Many patients whose digestive organs have been upset by ineffectual internal medication can be promptly relieved by this method. It quickly relieves the cough. At first, the expectoration of mucus is increased and rendered less viscid; after a few treatments the amount of the mucus rapidly lessens and with it the cough. In one case of bronchiectasis under the writer's care the mucopurulent expectoration cough and dyspnea rapidly decreased. The patient felt a decided relief after each injection, especially as regards the dyspnea.

As to its value in pulmonary tuberculosis, the writer feels that his observations have not extended over a sufficient length of time to warrant definite conclusions; but certain tentative deductions may be drawn from observed results. In the early stage when the infiltrated area was very small, when the afternoon fever was slight and the general nutrition not seriously impaired, it has seemed to be of benefit in lessening the liability to secondary infection and intercurrent attacks of bronchitis. In the second stage, when well-defined consolidation with bronchial breathing was present, and when secondary infection with its usual train of toxic symptoms was marked, decided and prompt benefit resulted from this method of treatment. Gastric irritation, which interferes with nutrition, frequently occurs in these patients from too active use of drugs.

This method offers us a means of controlling the local and general symptoms due to the pulmonary disorder, without recourse to internal drugging. It controls the cough more promptly than the usual methods and, though the expectoration is temporarily increased, the amount soon decreases and is more easily expelled. The fever and night-sweats decrease as the expectoration lessens and in proportion as the secondary infection is overcome. The dyspnea is improved and a general sense of relief folows its use. In the third stage, when the pulmonary tissue is rapidly

breaking down, when the cough, fever, night-sweats and dyspnea are marked, all that can be expected is a more or less temporary relief from the distressing symptoms. The writer does not claim any specific effect from this mode of treatment, but has seen marked and in a few instances permanent benefit in cases that have not done well under other methods of treatment. In all cases in which it has been used some relief has followed.

The results following its use in asthma are interesting and warrant further trial. This disease seems to be dependent upon many different factors, but from a practical standpoint we may consider it as a neurosis, with an exciting cause. We are also accusomed to divide our cases into the spasmodic and bronchial types. The value of intratracheal injections in the spasmodic type depends upon its power of relieving the acute symptoms and lessening the frequency of attacks. One case, that of a boy of fourteen, who for years had at night spasmodic attacks of dyspnea which were so severe as to prevent sleep, was markedly relieved by the intratracheal injections. The exciting cause in this case seemed to be in the nose and treatment was directed towards relieving the nasal obstruction. Before the nasal treatment was begun, the injections controlled the spasmodic attacks so that the patient could sleep all night, whereas before he was obliged to sit up several hours three or four nights a week. The correction of the nasal trouble has given him permanent relief, but during damp weather he occasionally has mild attacks, which are controlled by the injections.

Bronchial asthma is very satisfactorily relieved by the injections. The bronchial element, with the constant cough and expectoration is readily controlled, while the spasmodic attacks are lessened in frequency. In the case of a professional friend, who had bronchial asthma following an attack of acute laryngitis, the spasmodic attacks and dyspnea were relieved within a few minutes after the injection. In another case of bronchial asthma in an unmarried woman, aged twenty-eight, the benefit was marked. The patient gave a history of asthma and nasal trouble for two years. Her nose had been operated upon by a competent rhinologist, without modifying to any extent her asthma. When she first came under observation she showed the effects of incessant coughing and lack of sleep. She would wake about two or three o'clock every morning with a severe coughing spell, accompanied by dyspnea. This would last from three to four hours. Her general nutrition and digestion were poor. Her asthmatic attacks were worse during her menstrual periods. She was very nervous. The physical signs in her chest were those of bronchial asthma. The writer in the management of this case after a careful examination had three problems before him: First, the condition of the digestive organs, which in this case seemed the most probable exciting cause; second, the general underlying neurotic taint, which was very manifest; and, third, the bronchial element. The first two problems were met by the careful regulation of the mode of life, diet, etc., and the use of such drugs as would improve her digestion and tone up her nervous system. The third problem was met by intratracheal injections. These injections gave prompt relief, so that in less than a week she could sleep at night without inconvenience. The permanence of the benefit was undoubtedly influenced by the general treatment, yet the marked relief which followed the injections, when other methods had failed, was convincing proof of their efficacy.

Let us consider now some of the details to be observed in the use of this method. The writer has used the Muir tracheal syringe in his work. This syringe has a glass barrel holding four drams, with a cannula suitably bent for tracheal injections. A strong light, such as is commonly used in throat examinations, is advisable, although not absolutely essential. A laryngoscopic mirror is used to guide the cannula into the larynx. The technic is similar to laryngeal applications. A little practice and the observation of a few special rules will enable one quickly and easily to introduce the injection into the trachea with the minimum amount of discomfiture to the patient. The patient should hold his tongue out and the operator should introduce the cannula of the syringe guided by the mirror, during a deep inspiration. If the patient inhales gradually, slowly and steadily, the cannula can be introduced between the vocal cords, and from one to two drams injected without inconvenience. The operator should introduce the fluid gradually and steadily, not in spurts, and the whole amount must be introduced before the end of inspiration, otherwise choking will take place. The technic is comparatively simple in most cases, but in a few instances much dexterity will be required. The operator should explain to the patient just what is required on his part, and he can confidently assure the patient that the introduction will not cause pain. The choking sensation can be largely controlled voluntarily if the patient will steadily inhale during the injection. This may be difficult the first few times, but the knack can usually be acquired without trouble. The success of the method depends upon the co-operation of the patient and a reasonable degree of skill on the part of the operator. Unless one has the intelligent co-operation of the patient it is useless to attempt treatment by this method. This treatment is no more disagreeable than other applications to the throat and larynx.

The only cases where the writer has failed in the use of this method were dispensary patients where it was impossible to make them understand what it was necessary for them to do. After the cannula is in the trachea it is not necessary to keep the mirror in the throat while making the injection. If the curve of the instrument is not right, or if the operator is not careful, the injection may be made into the esophagus instead of in the trachea. One can easily tell

when the fluid is in the trachea by the coughing. The patient's sensations are also a guide. The injection runs into the ramifications of the bronchi and can be felt for a considerable length of time. Sometimes the patient feels the injection more on one side than on the other. This can be regulated to a certain extent by the patient inclining the body to one side. It also depends upon the inclination of the cannula in the trachea. The injection is usually felt more on the affected side, due presumably to greater sensitiveness of the mucous membrane of the bronchi on that side.

There are certain conditions that make the procedure difficult. Peculiarities in the shape of the epiglottis render the introduction of the cannula difficult. The epiglottis in one case under treatment is curved laterally and bent backward so that the cannula has to be introduced through a narrow slit.

Where the throat is sensitive, as in tuberculous laryngitis, it is advisable to spray the parts with a four-per-cent. solution of cocaine before using the injections. Nervous patients, especially those with sensitive throats, offer some difficulties, but these can be overcome in nearly every instance if patience and skill be used. Early in the writer's experience, he was in the habit of using a cocaine spray before the first injection, but this practice has been found unnecessary in the large majority of instances. When the larynx is placed high and the epiglottis upright, the cannula can be introduced easily without the mirror by simply pressing down the base of the tongue.

The selection of drugs and more especially the proper choice of a vehicle are very important. The writer's experience has been limited almost entirely to pure olive oil as a vehicle. This is non-irritating, easily absorbed, facilitates expectoration of the mucus and adds nutrition to the body in proportion to the amount used. In choosing drugs to be dissolved in the oil, preference has been given to those having antiseptic or sedative action. The list of drugs that have been used is a long one. The writer will confine himself to those which he has used. Creosote, 1 to 2 per cent., was used in the first few cases, but has been replaced by a solution containing menthol, 2 to 4 per cent., and liquid guaiacol, 1 to 2 per cent. Camphor is frequently added in the same proportion as the menthol. The writer has used ichthyol, 2 per cent., also iodoform, 2 per cent. A limited experience with chloretone, 2 to 4 per cent., combined with camphor-menthol, shows it to be of service. After the solution has been prepared, filter it through cotton or fine cheese-cloth to remove any sediment, then sterilize by placing the bottle in a water-bath and boiling the water for at least forty minutes. Of the various solutions mentioned above the menthol-guaiacol has been used more than any other.

The writer from his own personal experience with this method feels justified in drawing the following conclusions:

1. It is of no advantage in acute bronchitis, at least during the congestive stage.

2. It is of distinct advantage in subacute and chronic bronchitis.

3. It is of positive benefit in bronchiectasis.

4. It is valuable in pulmonary tuberculosis, relieving many of the symptoms, especially those due to secondary infection.

5. It quickly relieves the distressing symptoms of asthma. The amount of relief and the permanency depend largely upon the predisposing and exciting causes.

6. It in no way interferes with other lines of treatment.

7. The writer has never seen harm follow its use, although in a very few instances it excited severe coughing for a short time.

PRESBYOPIA: ACCOMMODATION: ASTIGMATISM.

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GLASSES are fitted to readers about forty years of age by rules and tables. The rules and tables in standard text-books have not been changed in fifty years and are supposedly based on tests of emmetropic or perfect eyes. Farsighted, nearsighted and astigmatic eyes made perfect by glasses may be used to make up tables, for emmetropes are hardly available, since about one person in a hundred is emmetropic.

In youth the focusing muscle can so mold the soft crystalline lens that fine print is distinct as near as three or four inches to the eye. As age advances the lens hardens and decreases the active focusing power until fine print, such as footnotes, can no longer be read at the proper reading distance. This condition is presbyopia. The active focusing power gradually decreases until about the seventieth year when the focusing muscle loses nearly all power over the hardened lens, and at this age the perfect eye needs for reading a magnifier equal in strength to what the active focusing power was just before presbyopia came on.

The statements here given are in standard text-books of ophthalmology: "Presbyopia is present in the perfect eye when fine print can no longer be read at eight and one-half inches from the eye." "After the age of forty-five perfect eyes need magnifying glasses for reading." "Some perfect eyes need magnifiers as early as the fortieth year." "After forty-five readers without magnifiers are nearsighted." "The perfect eye requires for reading an active focusing power of 4.5 D." "In presbyopia select the weakest magnifier which makes fine print distinct at eight and one-half inches from the eye. If the eye is farsighted, nearsighted or astigmatic, correct the imperfection and add the weakest magnifier which makes fine print distinct at eight and one-half inches."

Eight and one-half inches has little to do with presbyopia or prescribing glasses.[1] Those with perfect eyes who can read fine print at nine or

ten inches from the eyes are not presbyopic. If fine print can be read at nine or ten inches with glasses which correct all farsightedness, nearsightedness and astigmatism there is no presbyopia. The proper reading distance for people past middle age is *more*, often *much more*, than fourteen inches. If the eye in age sees fine print distinctly at eight and one-half inches, the glass is too strong and reading can not be held far enough from the eye.[2] The more print is magnified, the nearer it must approach the eyes, so, too, powerful magnifiers harm the aged by making too much convergence necessary and by doing all of the work of the focusing muscles.

In many presbyopes with uncorrected astigmatism, magnifiers fitted by the eight and one-half inch rule may apply, but this is not correction; it is injurious substitution by magnifying. In astigmatism, if the proper glass is not used, magnifying must make up for imperfect definition. If print is magnified, fineness and sharpness of outline are not so necessary, but the nearer must reading be held to the eyes. In old age if there is no astigmatism, or even with astigmatism perfectly corrected, a glass that makes fine print distinct at ten, eleven or more inches may do for continuous reading. If astigmatism of 1 or 2 D. is uncorrected, continuous reading is not possible unless the crystalline lens is soft enough, or unless there is enough magnifying to make fine print distinct at about eight or nine inches. If high astigmatism is uncorrected there must be for continuous reading either an active focusing power of more than 4.5 D. or its equivalent in magnifying, and this would make fine print distinct even nearer than eight and one-half inches.

Astigmatism is usually overlooked or imperfectly corrected. In uncorrected astigmatism, reading may be held so close that convergence fails and only one eye is used, the sight of the other is suppressed and in time becomes more or less amblyopic from lack of proper use.[3] The aged can not hold print close and use both eyes at the same time. Presbyopes who hold print close read with only one eye. If one eye is out or if the sight of one eye is suppressed the aged can read with nearly any magnifiers.

Most presbyopes with proper glasses can read nearly or quite as much as they ever could. If there is no astigmatism and the eyes are exactly alike, the presbyope often selects proper glasses for himself, is easily fitted, but not by the eight and one-half inch rule in the text-books.

Until the fiftieth year most people with farsighted, nearsighted and astigmatic eyes can read fine print, with glasses which totally correct these imperfections. Many at fifty-five years of age and some at sixty years can do this. Many, with normal distant vision, at fifty to sixty years of age have never used reading glasses, and yet are a trifle farsighted or astigmatic.

Presbyopia does not come at the fortieth year. Those who need glasses this early have farsightedness, nearsightedness or astigmatism. Belladonna is not used in testing the eyes of the aged, so the focusing muscle may mask imperfections after the fortieth year almost as much as earlier. Latent imperfections may exist until the sixty-fifth year.

Presbyopes who read several hours daily can not be fitted by rules in text-books. Aged readers do not need as much active focusing power as 4.5 D. About the seventieth year the nearsighted of 3 D., 13 inches, need no reading glasses; the farsighted of 3 D. need magnifiers of about 6 D., while the perfect eye needs a 3 D., 13 inch magnifier. The glass required and the distance at which fine print can be read depend upon the habitual reading distance, the kind of imperfection and upon the active focusing power.

Rules and tables can not be followed in fitting glasses. The table here given may aid in fitting the eyes of readers. Total farsightedness, nearsightedness and astigmatism are first corrected and the magnifier given in the tables added.

Age.	50	55	60	65	70	75
D.	0. to .75	.0 to 1.5	.75 to 2.	1.5 to 3.	2.to 3.5	2.5 to 4.

The following is a near-point table showing the distance at which fine print can be read at different ages. It is based on imperfect eyes, but glasses were used which corrected the total farsightedness, nearsightedness and astigmatism, but not presbyopia. The table is only approximate for the near point varies a little in different persons of any given age, even in eyes of any given imperfection. The active focusing power is somewhat greater in astigmatic, in farsighted and even in many nearsighted eyes,[5] than in perfect ones. The near point is given in inches and centimeters and the active focusing power in diopters.

Age.	10	15	20	25	30	35	40	45	50	55	60	65	70
In.	2 2-5	2 4-5	3 1-5	3 3-5	4 2-5	5 1-5	6 2-5	7 3-5	9 1-5	12	(20)	(50)	(100)
Cm.	6	7	8	9	11	13	16	19	23	30	(50)	(125)	(250)
D.	16	14	12	11	9	8	6	5	4	3	2	1	.5

In youth the active focusing power (amplitude of accommodation) depends almost entirely upon change of shape and but little upon change of position of the soft crystalline lens. In age the hard lens changes much in position and but little in shape and yet there may be considerable range of focus. Change of the size of the pupil and of the opening between the eyelids may directly contribute to the active focusing power. Pupillary contraction is probably a greater aid in reading than forward movement of the lens. The power of the pupil is best studied in lensless eyes. Cocaine or atropine is instilled until complete dilatation. A given magnifier now makes fine print distinct at a certain distance. If eserine is afterward used the pupil contracts to its utmost and the print will be distinct at a nearer distance with the same magnifier. In perfect eyes, or eyes made perfect by glasses, the activity and size of the pupil change but little with advancing years.[6] Is the small pupil of adults

and the aged normal? It may indicate eye strain, for it is not present in perfect eyes.

REFERENCES.

[1] Journal of the American Medical Association, May, 1899. p. 1032.
[2] Medical Record, Dec., 1898, p. 912.
[3] Medical Record, Oct., 1898, p. 528.
[4] N. Y. Medical Journal, July, 1900, p. 153.
[5] Ophthalmological Record, Oct., 1898, p. 492, Cases xvii, xviii, xxix, xlviii, lxxxii.
[6] MEDICAL NEWS, Dec., 1899, p. 866.

MEDICAL PROGRESS.

Agglutination of Pseudodiphtheria Bacilli by Antidiphtheritic Serum.—Scientific investigations have recently tended to confirm the opinion that the so-called pseudodiphtheria bacillus and the Klebs-Loeffler organisms are closely related species and that possibly under certain conditions they may be transferable forms. This has been gathered from many similarities in their characteristics. The subject is of vital importance in its relation to the bacteriological diagnosis of diphtheria. CH. LESIEUR (*Comptes Soc. de Biologie*, Aug., 1901) reports the study of seventy varieties of diphtheria and pseudodiphtheria bacilli from the standpoint of agglutination by antidiphtheritic serum. His work shows that this property is an inconstant characteristic of the true Klebs-Loeffler bacillus and is in no way related to its virulence. Furthermore that certain varieties of this organism can be agglutinated by the serum of horses immunized by cultures, while they do not react to the serum of horses immunized by toxins. The pseudobacillus conducts itself toward these sera precisely as does the true organism and by this means cannot be differentiated from it. This fact constitutes a new presumption in favor of the identity of certain species of pseudodiphtheria bacilli and the true diphtheria organism.

Navel Infection of the Newborn.—This subject is of interest on account of its somewhat frequent occurrence and the varied bacteriological conditions which underlie it. M. WASSERMANN (*Virchow's Archiv*, B. 165, H. 2) reports the study of eleven cases occurring in the Charity Clinic at München. All of the cases were fatal. On autopsy all showed the umbilical arteries full of thrombi and pus throughout their entire extent. In seven there was present a pneumonia with hemorrhagic fibrinous exudation accompanied by necrosis and abscess formation. Four were submitted to bacteriological examination. In all of these cover-slip preparations of the pus and sections of the lungs showed a bacillus whose morphological appearances were identical with those of the bacillus pyocyaneus. Its cultural and staining characteristics also corresponded with those of that organism. It was pathogenic for rabbits on inoculation and at death was found in their heart's blood. It is evident that this organism was the producer of the navel infection. This work increases the evidence in favor of the opinion that under certain conditions the bacillus pyocyaneus is a pathogenic organism for man.

Lecithine and Elimination of Uric Acid.—The action of lecithine upon the phenomena of nutrition has recently excited much interest by reason of the favorable results following its use in several of the so-called wasting diseases. It has been supposed that the elimination of uric acid is diminished by its use. This is an important question, as it concerns the destruction of the nucleins. The most recent study along this line comes from ALY ZAKY (*Comptes Soc. de Biologie*, Aug., 1901) who investigates the subject experimentally on two men and one woman. These were placed upon a stipulated diet and each was given thirty centigrams of lecithine daily. The estimations of the amount of uric acid excreted were obtained by the method of Tolin. There was an increase in the total amount of nitrogen excreted with a diminution of phosphoric acid. The amount of uric acid was, as a rule, decreased. All showed an increase in weight inside of ten days.

Bacteriology of Abscess Pus.—The bacteriological study of abscess pus is always of interest as conducive to the knowledge of the diversified microbic conditions which underlie circumscribed inflammation. W. SILBERSCHMIDT (*Ctlblt. f. Bak.*, Aug. 8, 1901) reports an interesting find in a man, fifty-eight years of age, who developed an abscess of the thigh. On operation the pus was found to be of a dark-brown color and very foul. Death followed in seven days. On bacteriological examination four organisms were found in the pus, as follows, a few cocci, a fair number of spindle-shaped bacilli, many long threads and many sharply curved spirilli. The last three organisms were also found in the lungs. Inoculation of the pus into guinea-pigs and mice produced abscesses from which the last three organisms were recovered. All of these organisms could be cultivated on the ordinary media, glucose-agar, agar, bouillon and gelatin, but the last three refused to grow after several transmissions. He believes that the process is to be regarded as a mixed infection due to the presence of the spindle-shaped bacilli, threads and spirilli.

Lecithine in Tuberculosis.—The favorable influence of this substance when administered to tuberculous patients has been announced in many quarters as the result of clinical observation. H. CLAUDE and ALY ZAKY (*Comptes Soc. de Biologie*, Aug., 1901) have recently studied the subject from both experimental and clinical standpoints. They subjected guinea-pigs to inoculations with tuberculous sputum and pure cultures of the bacillus. To some of these lecithine was administered in an oily emulsion containing 5 centigrams to the cubic centimeter. Others were preserved as control animals. These lost greatly in weight as the result of the tuberculous infection; some of them whose weight was 670 grams at the beginning were reduced to 490

grams at death. Those which received the lecithine suffered a much less reduction of weight and some even showed an increase. In a series of these animals which weighed collectively 1680 grams at the beginning this was increased to 1800 grams at death. It could not be said, however, that by this treatment the duration of the infection was materially prolonged. They observed clinically two cases of pulmonary tuberculosis in which the diagnosis had been established by microscopical examination of the sputum. To each of these was administered daily six pills of five centigrams each. Both increased in weight, one showing a 900-gram increase in six days. They do not think that lecithine has any specific effect upon tuberculous infection, but that it happily modifies the nutrition, making it more active, and diminishing the excretion of phosphorus. They thus consider it a valuable adjunct in the treatment of tuberculosis.

Negative Chemiotaxis of Leucocytes.—This phenomenon was first described by Metchnikoff in 1884, who, in examining the organs of rabbits and guinea-pigs very susceptible to anthrax and dead of this affection, remarked that phagocytosis was not observed here in spite of the fact that the leucocytes maintained their ameboid movements and hence were not poisoned. Since then it has been observed many times that a negative chemiotaxis of the leucocytes took place in animals very susceptible to a given organism when infected with it. A. ZILBERBERG and J. ZELIONY (*Annales de L'Institut Pasteur,* Aug. 25, 1901) have studied this question with respect to the infection of rabbits with the organism of fowl cholera to which they are especially susceptible. They injected into the auricular vein of three rabbits 4 c.c of an emulsion of 20-hour virulent agar cultures of this organism. Each rabbit received the contents of three or four such cultures. They were then killed at intervals of four, six and eight minutes after inoculation and microscopical study was instituted. They also submitted rabbits to subcutaneous and intraperitoneal inoculation with this organism and made similar study. In order to ascertain if there was a poisoning of the leucocytes, they injected these organisms into the peritoneal cavity of rabbits in which an artificial leucocytosis had been previously produced; no phagocytosis being instituted they then injected non-virulent staphylococci cultures. In every case the leucocytes evinced a phagocytotic action against these staphylococci. These phagocytosis often observed after the inoculation of supposedly virulent cultures of this organism is due to the presence in the same of non-virulent as well as virulent bacilli. The absence of this phagocytosis is not due to a poisoning of the leucocytes, but to a true negative chemiotaxis. The leucocytes preserve this property until the death of the animal and are even able to distinguish between virulent and non-virulent organisms in artificial cultures.

Tubercle Bacilli in the Stools of Tuberculous Persons.—It is the general impression that, except in cases of intestinal tuberculosis, the demonstration of the specific organism in the stools of tuberculous persons is attended with the greatest difficulty. D. ANGLADE (*Comptes Soc. de Biologie,* Aug., 1901) reports the investigation of a series of tuberculous cases from this standpoint. He claims to have had no difficulty in demonstrating the presence of the specific bacilli in the stools of such, even when there were no indications of intestinal tuberculosis present. His method of examination is that employed in the ordinary microscopical study of this organism by staining with Ziehl's solution and decolorizing with hydrochloric acid. He thinks that the intestine is a favorite route for the elimination of the bacillus and that the fecal matter is more often a source of dissemination of this organism than is generally supposed. He advocates the proper disinfection of the stools in all cases of tuberculosis.

Nephrectomy and Spermatogenesis.—The influence of nephrectomy on the genital function has hitherto received little or no consideration. The importance of the subject from a practical standpoint has led GUSTAVE LOISEL (*Comptes Soc. de Biologie,* Aug., 1901) to experimental work along this line. He removed the left kidney from a dog and thirty-five days after the operation made histological examination of the testicles. He found the intercanalicular spaces filled with spherical granulations which stained an intense black and were soluble in chloroform. These were found almost exclusively in the protoplasm of the interstitial cells. In the same region a certain number of the blood-vessels showed chronic inflammation. These granulations were found in the interior of the seminiferous canaliculi in the following distribution: (1) Very numerous in the zone of epithelial transformation (spermatozoids); (2) less abundant in the spermatocyte zone; (3) only a very small number in the zone of multiplication (spermatogenesis). The spermatozoa seemed to be normal in the greater part. He believes that these changes signify the degeneration of certain cells and alteration of the internal secretion of the testicle. These observations are new and increased work should be done along these lines.

Dilatation of Narrow Esophageal Strictures.—According to the statements of A. HENLE (*Centralblt. f. Chir.,* No. 34, 1901) many esophageal strictures which permitted only the passage of small quantities of fluid have been rendered permeable by the method of Socin. This consists in letting the patient wash down with his fluid food a small leaden shot to which is attached a fine, high-grade silk thread. Through the gastrostomy wound this is fished or washed out and then larger and larger threads are pulled through followed by instruments. Finally the gullet is made passable to solids. The objection to this highly rational procedure is that the thread and

sinker can not be reached in the stomach. Henle proposes and has used with greatest success a thread with several small iron sinkers, placed about an inch or two apart. The "fishing" for these is done rapidly, surely, and safely with a sound like a urethral sound converted into a strong magnet by an electric coil about its handle. The patient feels the thread jerk when the sinkers are attracted, and often the contact click can be heard by the surgeon. The sound-magnet, of course, is introduced through the gastrostomy fistula. The apparatus is not expensive.

Inunction versus Injection in Syphilis.—Sixty-nine cases of syphilis, which have been under his care for more than a year continuously, and of which 37 received intramuscular injections and 32 inunctions of mercury, are reported by C. F. MARSHALL (*Lancet*, Aug. 24, 1901). Of those subjected to injections 16 had relapses and 4 had iritis; of the inunction cases 7 relapsed and only 1 showed iritis. The conclusion drawn is that, although the injections have the advantage of cleanliness and privacy, for some reason they are deficient in certainty and ultimate medicinal influence, perhaps through imperfect absorption.

Pathogenesis of Flat Foot.—The much-vexed question of the pathogenesis of flat foot is epitomized by DE VLACCOS (*Revue de Chirurgie*, No. 8, 1901) in the following terms: The diversity of synonyms also indicates the divergence of the theories as to its cause. Those commonly employed in France are tarsalgia, pes-planus et dolorosus, and functional impotence of the peroneus longus, and are founded upon the theories respectively of arthritis (Gosselin), laxity of the tarsal ligaments (J. Guérin), relaxation of the dorsal ligaments (Le Fort), of the plantar ligaments (Tillaux), without any direct evidence of truth. All the lesions enumerated by the above hypotheses do certainly exist, but rather as secondary than as primary to the flat-foot. The real causal factors appear to be these. Vertical saw-cut through the sagittal median axis of the leg does not cut the middle of the os calcis, but rather between it and the internal border and often passes through or internal to that border itself in the normal subject. Hence the normal point of support in the foot at the os calcis is eccentric. Similarly the same plane of the saw-cut passes internal to the center of the astragalus, and only very rarely through its center. It is therefore easy to conceive why in some cases with this eccentric arrangement a twisting occurs so that at first a weakening, then a flattening of the plantar arch and finally an outward rotation occurs. At first the strong muscle tendons from the calf and in the sole of the foot with the ligaments resist, but finally something happens to break down the equilibrium. The os calcis is forced to rotate outward on its anteroposterior horizontal diameter, soon followed by the astragalus which then begins to strain at great advantage the calcaneo-scaphoid and the astragalo-scaphoid ligaments and joints. Faulty foot-gear undoubtedly is important, but must be regarded as rather secondary to anatomical error as delineated above. Perhaps its most direct action in accentuating the result of this faulty anatomy is that the external malleolus is pushed inward by contact with the shoe and therefore increases the rotation of the astragalus and os calcis.

Typhoid-Fever Bed-Bath Apparatus.—The Brand method of treating cases of typhoid fever, or at least the cold bath of some sort, is almost universally used now, but there is considerable difference of opinion in regard to the relative efficacy of slush or sponge baths as compared with the tub. The extra work necessitated by the tub-bath, together with the severe exertion on the part of the patient, has raised considerable doubt in the minds of many whether the tub really is of sufficient value to continue its use instead of sponge-bathing, especially since the tub is practically impossible in private practice. To avoid many of the disadvantages of the tub R. BELLAMY (*N. Y. Med. Jour.*, Sept. 7, 1901) has invented a special tub so arranged that a small wire mattress bed, on which the patient can be easily rolled, fits into the top of the tub and can be lowered into the water by means of small chains attached at each corner and regulated easily by a crank. Two nurses can thus give a tub-bath without any difficulty and also avoid any undue movement or exertion on the part of the patient. This would doubtless be very valuable in hospitals and could perhaps be employed at times in private practice.

Function of the Tonsils.—There has been such a wholesale removal of tonsils during the last few years that a reaction has now been started by some who believe in a more conservative treatment of the organ. Although we have found no function of the organ essential to the body welfare, no doubt its presence signifies that it is not without use. R. C. MATHENY (*Med. Rec.*, Sept. 14, 1901) believes that this lymphoid tissue which, together with the pharyngeal and lingual tonsils, forms a complete circle around the pharyngeal orifice and acts as a barrier to the passage of much that is deleterious to the organism. The presence of so much lymphoid tissue, the principal function of which is absorption, naturally leads one to believe that Nature has thus made an heroic effort to guard an important gateway. The fact that they are frequently inflamed may not indicate that they should be removed, but rather that they have received the toxic substance which might have caused greater havoc if allowed to enter the system elsewhere. He, however, does not argue so much against removal of the tonsils, for there are, of course, many which are very nefarious possessions, but rather he insists that the condition should be carefully observed and simple hypertrophy should not be considered an indication for operation.

Cause of Malignant Tumors.—Another parasite is now described as being the cause of

cancer and whether it may be later identified as the same organism that has been previously discovered by other persons is not known. J. E. BLAKE (*N. Y. Med. Jour.*, Sept. 14, 1901), in reviewing the work of Max Schüller on this question, says that he has positively found a parasite present in both sarcomata and carcinomata which has been isolated and when injected into the peritoneal cavities of guinea-pigs causes a similar growth. The secondary growths contain the parasite and it has again been isolated from them. The infectious character of malignant tumors would thus seem to be proven, but no one has yet found the organism outside the body.

Laryngeal Tuberculosis.—Laryngeal tuberculosis is one of the most painful and distressing diseases the physician sees and it is doubly unsatisfactory for the treatment seems almost useless, so far as local applications are concerned. ST. C. THOMSON (*Phila. Med. Jour.*, Sept. 14, 1901) says that the only two local methods of treatment which deserve any attention are the lactic acid and surgical procedures. The former is nothing more than a superficial caustic which could not in any way affect deep ulcerations or a perichonditis, except perhaps by increasing the irritation. Freudenthal, who has used it freely, states that "it ought to be dispensed with as antiquated and barbarous torture of the patients." So far as curettage is concerned many surgeons have employed this method in numerous cases without being able to report a single cure and eminent authorities have said that "the permanent radical cure of the local lesion of tuberculous laryngitis is not materially hastened by the various methods of treatment in any but an insignificant number of cases." The most satisfactory means of treating local lesions in the larynx are the same as when the lesion is located in any other part of the body and consist of attention to the general health and systemic improvement with local symptomatic sprays, etc. The specific cure for this disease has not yet been found, and until it has, the most rational means of improving the patient are found in assisting and fortifying Nature against its inroads.

Treatment of Whooping-Cough.—So little progress has been made in the treatment of whooping-cough that suggestions are gladly received and tried. T. J. MAYS (*N. Y. Med. Jour.*, Sept. 7, 1901) believes that this disease, as well as many pulmonary affections, is the result of irritation of the pneumogastric nerve and that the most successful mode of treatment is that which is applied locally to this nerve. Accordingly, counterirritation is used along the side of the neck immediately over the course of this nerve from the jaw to the clavicle. Gentle massage and kneading every two or three hours sometimes yield good results. A mustard plaster, two inches wide, reapplied till the full effects of the mustard are present is usually very efficacious. A combination of chloral, camphor and menthol may be used and in severe and obstinate cases he recommends the hypodermic use of silver nitrate. First, inject five minims of a 2½-per-cent. solution of cocaine; then detach the syringe from the needle and after filling the syringe with a 2½-per-cent. solution of silver nitrate, inject three to six minims of this solution by screwing the barrel onto the needle left in place.

Toxin and Antitoxin in Tuberculosis.—In 1895 Maragliano of Genoa pointed out the possibility of separating various toxic substances from pure cultures of tubercle bacilli. It was his purpose to utilize one of these toxins for immunizing horses, and in this manner to develop a specific antitoxin. L. FRENKEL and O. BRONSTEIN (*Berl. klin. Woch.*, Aug. 19, 1901) have produced toxins after the Maragliano method and have investigated the value of so-called antitoxic horse serum. They state that the antituberculous serum is harmless to men and animals. From experiments with guinea-pigs they conclude as follows: (1) A variety of derivatives are obtainable from cultures of tubercle bacilli; the most important of these derivatives are the tuberculous toxin (fluid and precipitated); the watery tuberculin and its precipitate; tubercle bacilli divested of fat (bacilli digrassati); (2) most of these derivatives are powerful poisons producing toxic effects in proportion to dose; (3) the injection of sufficient doses causes the death of animals with characteristic phenomena; (4) by means of small, but gradually increasing doses, animals can be immunized; (5) the serum of immunized animals possesses powerful antitoxic properties, which are capable of demonstration experimentally with relation to each of the toxins mentioned.

Infant Feeding.—After reviewing the various methods of modifying cow's milk to make it acceptable to an infant's stomach, C. G. KERLEY (*Med. Rec.*, Aug. 31, 1901) gives a table in which he combines cream, whole milk and water in such proportions that any desirable percentage can be easily obtained. He believes that during the hot months all milk should be heated to at least 155° F. for twenty minutes. It is rendered more indigestible in this way, but much safer. Peptonization is not successful, for when completely done the child will not take the bitter peptones and if only partially done the change is valueless. Cereal water added to the milk causes finer curds to form, but probably does not assist much in digestion. These diluents are useful on account of the nutrition they give rather than the mechanical assistance they offer. Cow's milk contains a large quantity of proteid in the form of casein which is represented by lactalbumin in mother's milk. To get rid of this indigestible casein in cases in which feeding is difficult, rennet may be used and the simple whey which is left may be given the infant for a few days, gradually increasing the fats in the form of cream. When the food is too strong, the appetite fails and if more is forced the child vomits. Fat in excess almost always causes colic and green, frequent

stools. Habitual colic, almost without exception, means too much proteid and it is one of the most frequent causes of habitual constipation. Sugar is most easily digested and seldom causes trouble.

Blood Examination.—The solutions in most common use for fixing the morphological elements of the blood in counting the red blood-cells with the Thoma-Zeiss apparatus are a 3-per-cent. aqueous solution of sodium chloride, Lugol's solution and Hayden's solution. The advantage of these solutions lies in the fact that they fix the corpusclar elements while they leave the blood plates unchanged. G. LA ROSA (*Centlblt. f. Path.*, July 15, 1901) has undertaken a series of investigations in order to ascertain which are the most advantageous solutions for this purpose. In addition to the above solutions he also employed the following: (1) A 1-per-cent. solution of sublimate to which .7 per cent of sodium chloride is added; (2) osmic acid solution, 1 to 4,000; (3) picric acid solution, 1 to 300; (4) tannic acid solution, 1 to 150; (5) Acquisto's solution; (6) Dotto's solution. He employed normal blood and also that of anemic and chlorotic patients. The picric and tannic acid solutions are not advantageous, since they cause an impairment of the morphological elements. The sodium chloride solution is to be discarded, because it alters the shape of the red blood-cells and makes their enumeration difficult. All of the others yield good results.

The Mechanical Reduction of Body-temperature.—By repeatedly tapping or striking the chest-wall with an elastic silver instrument resembling a paper-knife in shape, ERNI (*Corr' blatt f. Schweizer Aerzte*, Sept. 1, 1901) claims to be able to reduce the temperature of fever-ridden phthisical patients to an extent varying from 0.2 to 0.5°C. The instrument is held lightly between thumb and forefinger, and the entire chest-wall repeatedly struck, avoiding only the mammæ and bones lying directly beneath the skin, as the clavicle and sternum. The tapping is repeated every two days, each sitting being preceded by rubbing in a salve, such as a 15-per-cent. salicylic-turpentine preparation, to soften the skin. After being tapped for ten or fifteen minutes, the skin becomes very red; a dull ache is at first experienced by the patient, but this is rapidly succeeded by a feeling of comfort and well-being. The treatment is not advisable in women during menstruation, and is to be avoided in nervous individuals generally on account of the excitement it produces. The reduction of temperature by this method is explained as a purely physiological phenomenon, capable of demonstration in normal individuals.

Nasal Therapy in Neuroses.—Ten years ago, while observing a case of whooping-cough, it was noticed by L. KURT (*Wiener klin. Rundschau*, Sept. 1, 1901) that spasm of the glottis could be controlled by irritation of the conjunctiva or of the nasal mucous membrane. Since that time Kürt has employed stimulation of the nasal mucous membrane in the treatment of various neuroses of a spastic nature. The stimulation may be produced by various mechanical processes; for more persistent and powerful irritation quinine or pulverized sugar are used, or powdered rhizome of veratrum album. Among the conditions successfully treated by this means are laryngeal spasm, blepharospasm, *tic convulsif*. In rare instances epileptic attacks are said to have been controlled by strong irritation of trifacial branches. In asthmatics and in persons suffering from nervous cough the method does not succeed.

Treatment of Cancer by X-Rays.—The treatment of external forms of cancer by X-rays is reported to have caused healing or improvement in a series of cases persistently treated by F. H. WILLIAMS (*Boston Med. & Surg. Jour.*, Sept. 12, 1901). The exposure of the diseased area to the X-rays for a few minutes two or three times a week for several weeks, is in general what is required. Where the growth is extensive, a longer time is necessary; on the other hand in early cases ten exposures or even less may suffice. The cases treated by Dr. Williams include not only the smaller and lesser forms, but some which were inoperable. Diagnosis in all these cases was based upon careful microscopical examination. Some of the growths were typical epitheliomas; others were of the rodent ulcer type; others were clinically epithelioma, but microscopically were composed of chronic inflammatory tissue.

A Peculiar Characteristic of Malarial Blood.—If two drops of blood from different malarial patients be placed in contact under the microscope, it is noticed that after a minute or so the red blood-cells arrange themselves in groups and masses, each group consisting of from 5 to 100 erythrocytes. The leucocytes do not participate in the group-formation. The rouleaux of normal blood do not form under these conditions. This peculiar agglutination-power is acquired by normal blood by contact with malarial blood. As long as this phenomenon persists, malaria cannot be regarded as cured, according to the statement of GRIXONI (*Gazz. degli osped.*, No. 57, 1901). The agglutination reaction is destroyed by the action of quinine. Its continued presence is said to be of importance from the standpoints of diagnosis, prophylaxis and prognosis.

Cystitis, Pyelitis, and Pyelonephritis.—In a very complete article upon the diagnosis and treatment of the above conditions, T. R. BROWN (*Med. Rec.*, Sept. 7, 1901) gives many valuable hints. The great majority of such cases are due to infection with various micro-organisms (of which the colon bacillus is the commonest) which may reach the bladder exogenously or endogenously. Simple urinary hyperacidity may so closely simulate vesical infections that only careful microsopical and chemical analysis can determine the nature of the trouble. Prophylaxis is most essential, especially in all cases needing catheterization. While an absolute diagnosis of

renal infection can be made only by ureteral catheterism, a probable diagnosis can usually be made after a determination of the relation of albuminuria to pyuria is made and by a careful examination of the bladder around the ureteral openings. Speaking generally, in all cases of bladder infection, even where pyuria is of high grade, the albumin is slight, while in pyelitis and pyelonephritis there is much more albumin present. This point is especially important where ureteral catheterism is impossible. Contrary to most opinions a great majority of both bladder and renal infections are associated with acidity of the urine, that is, due to germs which do not break up urea. In nearly all cases of renal infection causing alkaline urine, after a time a stone is formed about the bacteria as a nucleus.

Tuberculosis and Disinfection.—Much diversity of opinion exists as to the value of various methods of disinfection when applied under different conditions to the bacillus tuberculosis. Practically the entire renovation of infected apartments has been deemed necessary for effective results. Recently FRANK STEINITZ (*Ztschrift f. Hygiene u. Inf.*, Aug. 27, 1901) has gone over the entire subject from an experimental standpoint. His researches were carried on by submitting tuberculous material to the action of various disinfectants and subsequent inoculation into guinea-pigs. Due precautions were taken in order that none of the antiseptic should be carried into the bodies of the research animals and thus lead to false conclusions. He experimented with fresh sputum, contaminated clothing and infected apartments. The disinfecting agents employed were iodine trichloride, formalin and formaldehyde, sulphate of copper, hydrochloric acid, alcohol and sublimate and sublimate alcohol. Fresh sputum should be received into receptacles which can be burned or disinfected by heat, or such sputum should be exposed to the action of a 1-1,000 sublimate solution for five hours. Those portions of dwellings which have been especially contaminated should be thoroughly washed with a 1-500 sublimate solution and all washable clothing should be soaked in such a solution for three hours. The entire dwelling should then be submitted to the action of formaldehyde gas.

Hereditary Syphilis and Tuberculosis.—The ultimate prognosis of this form of syphilis is discussed by KARCHER (*Correspondenz-Blatt für Schweizer Aerzte*, Aug. 5th, 1901). He believes with Hochsinger and Pott that the chances of eradicating all traces of it from the system by early and appropriate treatment are much better than is generally supposed. But while the majority of children with inherited syphilis, who have had even one thorough course of mercurial inunctions, show no further signs of this malady, their susceptibility to tuberculosis in its various forms is much greater, apparently, than that of non-luetic children. Of thirty cases treated and discharged as healthy from the Children's Hospital at Basel, between 1876-1896, Karcher was able to hear of but sixteen. Of these six had died in infancy, five were found to be suffering from tuberculous affections, and the remainder were considered perfectly healthy. Karcher urges that mercurial treatment be instituted in all cases as soon as possible and be diligently carried out, not alone for suppressing present hereditary syphilis, but as a guarantee against future manifestations, as well.

Tuberculous Bacilli in Butter.—This subject was first brought before the profession in 1899 by researches carried on in the Hygienic Institute at Breslau. Since that time a vast amount of investigation has been carried on along this line and many workers have announced the frequent occurrence of so-called tuberculosis-like bacilli in butter. These organisms have practically the same staining reaction and morphology as the tubercle bacillus, but are non-pathogenic for research animals. Very recently F. KERR and M. BENINDE (*Ztschrift f. Hygiene u. Inf.*, Aug. 27, 1901) have submitted this subject to extensive examination. They conducted their investigations by fluidifying various specimens of butter and the subsequent inoculation of such material into guinea-pigs and rabbits. The former were inoculated intraperitoneally and the latter into the anterior chamber of the eye. After various intervals these animals were submitted to bacteriological and pathological examination. Forty-five specimens of butter were thus investigated in two series of studies. In the first series 11.1 per cent. and in the second 15.5 per cent. showed the presence of true tubercle bacilli. In 15 cases so-called tubercle bacilli were found. A contaminated butter-source can continuously produce infected butter or such may be only temporary. In all butter examinations for the presence of this organism, Obermuller's method is to be earnestly commended. In this work microscopical examination cannot be relied upon to differentiate true tuberculous organisms from the tuberculosis-like bacilli. In infected milk the true organism may be present in the skim milk, buttermilk, cream or butter made therefrom, but the latter two are liable to the greatest contamination. The manipulations through which the milk is passed in the manufacture of butter have no influence in separating the bacilli from the milk.

Pasteurization of Cream and Tuberculous Butter.—Diversity of opinion exists as to the efficiency of the pasteurization of cream in the prevention of the spread of tuberculosis by butter; also as to whether this process alters the nutritive value and taste of the butter. F. HERR (*Ztschrift f. Hygiene u. Inf.*, Aug. 27, 1901) studies this subject by the observation of the effect of different temperatures and various time exposures to such upon infected butter. This was also submitted to chemical examination in order to ascertain the change, if any, in nutritive value. He recommends that cream be exposed to pasteurization at 85° C. for two minutes. This is amply sufficient for the destruction of any tubercle bacilli present and has no effect upon the nutritive value or taste of the butter.

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TRAITORS IN THE RANKS.

IMMEDIATELY following the death and autopsy of the late President, there appeared signed articles in the daily press from several prominent physicians in this city, and an editorial in a leading medical journal, openly criticizing the physicians who attended President McKinley in a manner that has stung the whole medical fraternity into expressions of shame and scorn—shame that the editor of a journal that has always upheld the honor and dignity of the profession should have stooped from his high position to traduce by innuendo and covert criticism the medical men who attended the late President; scorn that any physician should have sunk to the level of the scandal mongers of the sensational press and deliberately suggest to an excited and believing public weapons of suspicion to be used at random against the men who have handled this famous case.

It can readily be imagined that it must have been trying to the yellow journals that the X-ray apparatus was not used, and that they were defrauded of a skiagram of the dying President; but that any physician should sneer at the conscientious conclusions reached by the anxious surgeons to dispense with the X-rays and should state concerning this opinion that "it seemed safer to guess than to be sure" is, we feel, little short of an insult. "What excuse," is asked, "must be offered to the public for the utter inability to find the bullet even in the dead body?" But why, we ask, should the sympathetic, overwrought public think of demanding excuses from the medical men who by their strenuous efforts prolonged, for a week, the life of the doomed President, unless the idea had been suggested? To hint to the public that they are aggrieved and that they have a right to ask the surgeons to explain "why they allowed a lost ball to be buried with the victim's body" is little short of trying to make the Nation's tragedy a popular spectacle.

It is not, however, this gallery play that deserves the severest condemnation. It is the subtle way in which many of these articles have been worded so that while they seem to mingle praise for the surgeons with lamentations over the inevitable, they nevertheless convey to the reader a startled sense of suspicion and alarm that all was not done that might have been done. We are ashamed of this utter violation of professional standards, of the manifest unfairness of making charges when the accusers could not possibly be in possession of the full details of the case, of the lack of charity in dealing treacherous, underhand blows to the few and of this holding up to public criticism a vicious cartoon of medical men so prominent that the entire medical profession must bear the scoffs. It is these things that have amazed, pained and angered the American medical brotherhood.

To so cruelly and maliciously hint that a "fatal blunder in diagnosis had been made," especially after the autopsy had demonstrated the necessarily fatal character of the wound, is evidence of a very low standard of professional ethics, and it is not to be wondered that the attending surgeons and the medical profession of the country should feel the affront and demand an apology.

THE INTESTINE AND ITS BACTERIA.

ALTHOUGH scientific investigation has accomplished much toward the elucidation of the many unsolved problems which are connected with different physiological and pathological processes from time to time inaugurated in the human body, the full significance of the intestinal bacteria to such processes has not been as yet fully appreciated. This is, without doubt, very largely

due to the great variation in the chemical composition of the intestinal contents which places before us a vast number of different nutrient conditions very few of which we are able to reproduce artificially.

The intestinal secretion acts as an adjuvant to the pancreatic and albuminoid ferments and has a bactericidal action upon micro-organisms. By its alkaline reaction it tends to neutralize the acidity produced by the digestion of the carbohydrates and the action of bacteria. The intestinal contents include all the nutritive principles necessary to bacterial life and being of the proper reaction they contain an enormous number of micro-organisms. These may be classified as obligate and facultative intestinal bacteria, different portions of the intestinal tract possessing their own peculiar obligate microbes.

Investigation has shown that the vast majority of foreign bacteria which are introduced into the intestinal tract in health perish and cannot be regained from the feces, thus proving that the body in this location is provided with means of protection from infective invasion. Research has also shown that in diseased conditions of the intestinal mucous membrane this protective power is very seriously impaired, so that foreign organisms introduced at such a time are recovered from the feces with comparative ease. The reason that the obligate intestinal bacteria are not also destroyed by these means is to be ascribed to acclimation of these organisms to the environment in which they live. The meconium is sterile, and all bacteria are originally introduced into the intestine from without, yet it has been impossible to produce sterile feces, except in the first days of life, by the feeding of sterile food, because the obligate organisms already present in the intestine are capable of indefinite multiplication.

The ability of these obligate bacteria, especially the colon bacillus, to assume pathogenic properties has in recent years been much discussed. There seems to be no doubt that when this organism wanders from its normal habitat and invades other regions of the body it may produce diseased conditions, but carefully conducted bacteriological investigations have conclusively shown that this tendency has been overestimated. As to whether this organism ever plays a pathological rôle in its normal location is somewhat doubtful, but it is probable that under conditions which materially lower the natural protective power of the intestine such may occasionally be the case.

Much that is illusory has been written and accepted in regard to the bactericidal action of many agents which are introduced into the intestine with the idea of destroying or inhibiting the growth of foreign pathogenic bacteria. Although at first sight an apparently feasible idea, careful thought will show that the employment of such means is in all probability harmful rather than beneficial, as a greater inhibiting action is exercised by these substances upon the natural protective functions of the intestine than upon the micro-organisms present. This is to be gathered by analogy from the effect of these substances when employed for a like purpose in other regions of the body. The widespread employment of intestinal antiseptics cannot be accepted at the present time as on sound foundation, as their use is based upon incomplete and faulty deductions and their employment fosters the delusion that we are employing scientific medication. Until we shall be supplied with means by the use of which we can accentuate the natural protective functions of the intestine the most logical method of ridding the tract of foreign pathogenic bacteria is that which seeks in diseased conditions to restore to the intestine its normal protective power.

THE MENOPAUSE.

IN spite of what has been written on this subject in recent years, many practitioners, especially among the older men, cling to the fallacy that the change of life is a critical, that is, a dangerous time, that the profuse hemorrhages which often accompany it are in some way necessary and not to be avoided, that the whole train of gastric, nervous, and other disturbances are in some mysterious way a part of Nature's economy in passing a woman from the childbearing period to that which lies beyond it.

Consequently, those who hold such views simply follow a plan of masterly inactivity, the expectant plan it is called, leaving Nature to do the bad work and in due season provide the remedy—perhaps. It is strange that the instructive lessons which have been taught by those who pass the menopause prematurely have been apparently lost by so many. Here are thousands of women who through the loss of their essential genital organs have anticipated the change of life. They have been distributed over every portion of the civilized world, so that it would be strange, in-

deed, if some of them had not come under the eye of every observant physician. They have had no hemorrhages, at least, that is the rule, for in only ten per cent. of those from whom the ovaries have been removed do the menses persist. The nervous phenomena are common enough and in many cases the doctor is called upon to relieve such troubles. With the exception of bleeding the experience in a great many of the cases of premature menopause is not dissimilar from that which occurs at the ordinary menopause. Hemorrhage, therefore, is plainly not a necessity, and the other phenomena can often be relieved by a careful and intelligent mode of procedure.

It is not difficult to outline a plan of treatment which will apply to very many of the women who are passing through the menopause at the customary period of life, that is, between the forty-fifth and fiftieth year. The universal accompaniment of this period is the nerve shock which attends vasomotor spasm and paralysis, the flushing or pallor, and the uncomfortable sensations, nausea, vomiting, weakness, etc., which a large proportion of women experience, especially during the first year after the menses become irregular or have ceased. These phenomena are usually inevitable and it is well to recognize this fact and mitigate them as far as possible. Probably no medicament is of greater service for this condition than the bromides, especially sodium, or ammonium, or strontium, given at regular intervals, twice or three times daily, in five-, ten-, or fifteen-grain doses as the condition may indicate. Hemorrhage during the menopause is not inevitable; if it is very common, it is an evidence of disease—usually a diseased endometrium; it is occasionally an evidence of malignant disease. Between hemorrhage at the menopause and cancer there is no such relation as cause and effect. It happens that cancer of the uterus develops in a large number of cases about the period of life when the menopause usually occurs, but the percentage of women who go through the experiences of the menopause and those of cancer of the uterus as well is very small when compared with those who do not have cancer of the uterus.

The treatment for the hemorrhage is mainly mechanical, thorough curettage of the diseased mucous membrane, and it is not unusual that this treatment should be repeated, perhaps several times before the end of the menopause is reached. Not infrequently the condition of the nervous system during this period is one of decided tension and this should be carefully regarded and treated, not only with sedative drugs, but with agreeable and interesting occupation, with suitable change of climate, if necessary and possible, with well-regulated diet always, and as pleasant surroundings as the conditions of the case will allow. On the whole, therefore, it is decidedly to be hoped that the old teachings concerning the menopause and its treatment may be abandoned and that the rational foundation upon which its true pathology rests may serve the purposes of the future.

ECHOES AND NEWS.

NEW YORK.

Bequest to St. Luke's Hospital.—By the will of Daniel T. Hoag, St. Luke's Hospital is to receive a legacy of $3,000.

Yellow Fever in Cuba via New York.—Eight new cases of yellow fever have developed among the crew of the British steamer "Ethelbrytha," Captain Turgoose, which arrived in New York Friday last from Jacksonville, and indirectly from New York, with three cases of the fever on board. The eleven sufferers are being treated at the yellow fever hospital and are all doing well.

New York County Medical Society Officers.—The following officers were nominated for the ensuing year: President, Dr. Frank Van Fleet; First Vice-President, Dr. Charles N. Dowd; Second Vice-President, Robert Lewis, Jr.; Treasurer, Dr. E. W. Peet; Secretary, Dr. John Van Doren Young; Assistant Secretary, Dr. E. P. Fowler; Censors, Dr. George B. Fowler, Dr. H. S. Stern, Dr. Wendell C. Phillips, Dr. Robert F. Morris, and Dr. James F. McKernon. One hundred and seventy-five delegates were elected to the State Medical Society and a committee was appointed to arrange for a reception to the State Society when it meets at the Academy of Medicine here for its semi-annual session, October 15th and 16th.

Hospital Beneficiaries.—The late Harriet Wilcox made provision in her will for the following hospital charities: New York Skin and Cancer Hospital, $20,000; Home for Consumptives, $10,000.

New York County Medical Society and the Milk Supply.—The first meeting of the fall was held Monday, September 23d. The President, George B. Fowler, M.D., in the chair.

The chief interest of the meeting was the report of the Milk Commission appointed in January, 1900, consisting of Drs. Henry Dwight Chapin, Abraham Jacobi, W. L. Carr, and Joseph E. Winters. The report was read by Dr. Chapin, the Chairman of the committee. He first spoke of what the committee had done, having made over 800 bacteriological tests, thirty visits to farms, many of them more than 200 miles from the city, and having had two conferences with milk dealers.

"From a chemical point of view," he said, "we found the milk good. Out of twenty samples which we examined all showed at least 4 per cent., and some 5 per cent., of fat, while the law requires but 3 per cent. So we devoted our attention to the bacteriological conditions of milk and the question as to its proper handling and preservation.

"It has seemed wise to establish a standard of cleanliness for a bacteria standard to which dealers must conform. The standard prescribed by the commission is that the acidity must not be higher than 3 per cent. and that the milk must not contain more than 30,000 germs or bacteria of any kind per cubic centimeter, and that butter fat must reach 3.5 per cent.

"The amount of bacteria in the milk used in the city is something alarming. Out of twenty samples examined on a winter day, November 19th, the lowest was 90,000 germs and the highest 2,280,000, while on June 29th, with the thermometer at 90 degrees, out of twenty samples examined the lowest contained 240,000 and the highest 516,000,000 per cubic centimeter. The prevalence of bacteria, to a great extent, arises from the dirt in the milk.

"There are seven conditions on which the amount of bacteria depends—the cleanliness of the barn, condition of the cow, condition of the milker, condition of the utensils, the cooling process, the transportation, and the cleaning of the milk bottles before they are returned."

Aeration, he said, is not a success to-day as used by the ordinary farmer. In good hands it might work all right, but in many cases as at present used it resulted in an increase of germs. The three things which are absolutely necessary to secure milk comparatively free from germs are strict cleanliness, rapid and sufficient cooling, and thorough icing of milk until it reaches the consumers. In the transportation of milk, ordinary freight cars should not be used, and the ends of the cars should be kept closed, thus preventing the heated air from passing through the car and breeding the germs. The railroads could be asked to cooperate and furnish refrigerating cars in which the milk could be kept constantly on ice, and after being unloaded it should be re-iced before reaching the dealers.

The Milk Commissioners, he said, agree to guarantee or certify the milk of all dealers desiring such certificates, a special label having been printed for this purpose.

PHILADELPHIA.

Pennsylvania State Medical Society.—The fifty-first annual meeting of this Society was held in Horticultural Hall September 24th, 25th, and 26th, under the presidency of Dr. T. D. Davis of Pittsburg. The scientific program was an unusually large and varied one, and the papers were of a high standard of merit. (See MEDICAL NEWS of this week.) An innovation was the special lantern demonstration given Thursday evening. The social side of the meeting was well arranged and satisfactorily carried out. It included receptions by Dr. John V. Shoemaker, Dr. James Tyson, the Philadelphia County Medical Society, the Trustees and Faculties of the Jefferson, Woman's, and Medico-Chirurgical Colleges, and the Medical Club. Wednesday afternoon the University of Pennsylvania gave a lawn party in honor of the Society and its guests. During the week a number of special clinics were held at the various medical schools and hospitals. A full report of the scientific business appears on another page.

New Site for Children's Seashore House.—New property has been obtained for the above institution at Atlantic City. The plot extends between Annapolis and Richmond avenues, Chelsea, and is a great improvement over the old location. Three buildings will be erected. The main building will be 300 by 84 feet in size and four stories high. The two other buildings will each be made up of sixteen little cottages under the same roof and will be 156 by 44 feet. The center of the property will be left vacant for a playground. The buildings will be ready for occupancy next summer.

County Medical Society.—The North Branch organized September 19th by electing Dr. A. M. Eaton chairman and Dr. R. L. Pitfield clerk. South and West branches will probably be organized in the near future.

Western Pennsylvania Medical College.—This college in Pittsburg has opened for the session with a great many changes in the faculty. The following are the more important changes in professorships: Dr. W. H. Ingram, histology, pathology, and bacteriology; Dr. M. R. Ward, diseases of nose and throat; Drs. R. W. Stewart and J. J. Buchanan, principles of surgery and clinical surgery; Dr. S. L. McCurdy, orthopedic surgery; Dr. G. N. Munro, Jr., legal medicine.

Smallpox and the Municipal Hospital.—The opposition of the citizens living near the Municipal Hospital has taken definite form in the signing of petitions and the holding of two large mass meetings Saturday evening, September 21st. During that week 38 new cases of smallpox and 4 deaths had been reported, 26 of the new cases occurring in the Twenty-eighth Ward, where the hospital is located. The hospital authorities are about to erect an annex for the purpose of isolating smallpox patients. The citizens in mass meeting have demanded three things of the city officials: (1) The removal of the smallpox sections of the Municipal Hospital to a more isolated part of the city; (2) the immediate abandonment of the projected annex; (3) energetic instead of lax methods on the

part of the officials in fighting the disease. Medical inspectors of schools have been notified by health officers to report any cases of unvaccinated children, and vigorous efforts are being made to have vaccination made general.

The Progress of Surgery as Influenced by Vivisection.—Under the above title Dr. W. W. Keen contributes an article which is published in recent issues of the Philadelphia *Record*. The writer puts before the general public the advantages which have accrued to the surgeon and his patients from animal experimentation. From his introduction we take the following statement: "Two water companies in London in 1853 experimented on 500,000 human beings, and, as a result of the cholera, one of them killed 3,476 human beings. In that same year Thiersch, in Leipzig, experimented on 56 mice. Had the lesson of these few mice been heeded the lives of these human beings might have been saved." After speaking of the importance of antisepsis and its growth from experimentation, Dr. Keen speaks in detail of the operations upon various organs of the body which have been shown feasible by first performing them upon animals. He confines himself almost wholly to those which have occurred during his professional life in order to speak of what he personally knows. He concludes as follows: "Although I myself am not a vivisectionist, yet I could not do the work I do every day and accomplish results I do were it not for just such work, of which I take advantage. I cannot believe that any unprejudiced, fair-minded reader will not agree with me that such humane purposes should be fostered and not hindered, should be encouraged and not abolished."

Dr. Miller Honored.—Dr. John S. Miller, of Denver, Colo., formerly a demonstrator of anatomy in Jefferson Medical College and surgeon to St. Joseph's Hospital, during a visit to this city was tendered a dinner by his professional friends September 10th. Dr. F. X. Dercum acted as toastmaster.

Examination Fees not Returnable.—William McKenzie has brought suit against the Hahnemann Medical College for the return of $30 which was paid as a "graduation" fee, the plaintiff having failed to graduate. The defendant avers that this fee does not insure graduation, but only covers expenses incident to examination and commencement exercises, and under no circumstances is returnable.

Extermination of Mosquitoes.—It is stated that the State Entomologist of New Jersey will ask the Legislature at its next session for an appropriation of $10,000 for the purpose of conducting a study of the mosquito with a view to its extermination.

Western Pennsylvania Medical College.—Dr. Stewart L. McCurdy, Professor of Anatomy and Surgery in the Dental Department of the Western University, has been elected to the chair of orthopedic surgery in the Western Pennsylvania Medical College at Pittsburg. Dr. McCurdy was at one time professor of orthopedic surgery in the Ohio Medical University.

Evening Medical School.—The Medical Department of Temple College, the combined day and night school under the presidency of Rev. Russell H. Conwell, has been entirely reorganized and opened for the session of 1901-02 September 16th. The course covers five years, the entire work being given in the evening. Sessions are from 6:45 to 9:45 P. M. daily. The yearly fees are $125.

CHICAGO.

New Hospital.—The new hospital of the Sisters of Mary, built at a cost of $250,000, is nearing completion. The structure is six stories high, fireproof, of cut stone and pressed brick, with strikingly high porticoed entrances. The ground dimensions are 196 by 87 feet. The operating-rooms are on the top floor. On the north and south sides of the building are enclosed porches, which can be so heated as to be habitable the year round.

Outbreak of Anthrax.—The recent outbreak of anthrax at Palatine and its increasing prevalence in the surrounding country, which is largely devoted to dairying interests, prompted Health Commissioner Reynolds to send the Secretary of the Department, together with one of its meat inspectors, to that section to investigate the existing conditions. As a result, and at the suggestion of the representatives of the Department, the farmers throughout the infected district have formed a local association for the purpose of stamping out the disease and preventing its further spread. This association has pledged the Department that no milk or veal calves or beef cattle will be shipped from any of the infected herds. In view of these pledges, and the thoroughly reliable character of the men who made them, it was not deemed necessary on the part of the city to establish any quarantine against the food supplies from this district. It is believed that with the enforcement of the measures now under way the present outbreak will soon be under control.

GENERAL.

Morristown and Malaria.—Much comment is being aroused concerning the great prevalence of malaria in this city. The old system of water-works, with its contingent of over 200 cesspools, is supposed to bear some relation to the disease, but the wet season and the great increase in mosquitoes are not mentioned, although they are much more important factors.

State Asylum in Nebraska Burned.—The State Insane Asylum and adjacent buildings, eight in all, were destroyed by fire September 23d. Six hundred patients were in the institu-

tions at the time, three of whom are missing and supposed to have been burned to death.

The Doctors' Bills.—The sensational press is agitating the subject of the bills of the doctors who attended the late President McKinley. It is to be hoped that the niggardly policy pursued by Congress in the case of President Garfield will not be followed in the present instance.

Leprosy in Honolulu.—Leprosy is being slowly but none the less certainly eradicated in the Hawaiian Islands. Five years ago there were over thirteen hundred inmates at the leper settlement on the island of Molokai; when the annual visit was made a few days ago there were barely nine hundred. This is due to the method of treatment by isolation and quarantine.

Pasteur Institute in India.—The Pasteur Institute at Kasauli completed its first year's work on August 8th. The total number of patients received during the twelve months was 321, namely, 146 Europeans, 175 natives, of whom ninetv-six belonged to the British army and twenty-five to the Native army. There was not a single failure in the treatment among the Europeans, and only two among the natives. In the latter cases the patients had been severely bitten, and arrived so late that successful treatment was impossible. There were thirty patients under treatment August 9th. The saving to the Government is very large, as no British soldiers have been sent to Paris since the Kasauli Institute was opened.

Promotion for Dr. Rixey.—President Roosevelt has notified Mrs. McKinley, through Secretary Cortelyou, that, in pursuance of the intention of the late President McKinley, and in recognition of devoted services, as well as because of eminent fitness, Medical Inspector P. M. Rixey will be appointed Surgeon-General of the Navy upon the expiration of the term of Surgeon-General Van Reypen. The Secretary of the Navy has been requested by the President to instruct Dr. Rixey to make such arrangements as will enable him to continue, if needed, his care for Mrs. McKinley between now and the time of his appointment to his new office. The naval list shows that Surgeon-General Van Reypen will not retire in the ordinary course until November 14, 1902. Dr. Rixey stands No. 28 on the list of naval surgeons. Though Surgeon-General Van Reypen's retirement from active service does not occur for more than a year, his commission as surgeon-general, which was for a period of four years, will expire on December 18, and Dr. Rixey's appointment may be expected then.

More Smallpox in Newark.—It is feared smallpox is getting a new hold in this city. There is every indication that this month will prove a record breaker. Eight patients suffering of the disease have been taken to the hospital September 18th. Among them was Health Inspector John Bull, who has since died from the disease. There have been 25 cases of smallpox so far this month. Since last February, when the first case developed this year, there have been 128 cases and 19 deaths.

Physician to the Indian Service.—The United States Civil Service Commission invites attention to the examination which will be held at various places throughout the United States on October 22d for the position of physician in the Indian Service. The examination will consist of the subjects mentioned below, which will be weighted as follows:

1. Letter-writing	5
2. Anatomy and physiology	15
3. Chemistry, materia medica, and therapeutics	10
4. General pathology and theory and practice of medicine	25
5. Surgery	20
6. Bacteriology and hygiene	10
7. Obstetrics and gynecology	15
Total	100

Information relative to the subjects and scope of the examination may be found in section 125 of the Manual of Examinations revised to January 1, 1901. The age limit is twenty-five to fifty-five years. From the eligibles resulting from this examination it is expected that certification will be made to the position of physician in the Indian Service at White Earth Agency, Minnesota, at a salary of $900 *per annum*, and to other similar vacancies as they may occur. This examination is open to all citizens of the United States who comply with the requirements and desire to enter the Service. All such persons are invited to apply, and applicants will be examined, graded and certified with entire impartiality and wholly without regard to any consideration save their ability as shown by the grade attained in the examination. Preference may be given to residents of the Indian Service district in which the vacancy exists. Persons who desire to compete should at once apply to the United States Civil Service Commission, Washington, D. C., for application forms 304 and 375, which should be properly executed and filed with the Commission prior to the hour of closing business on October 12, 1901.

Assistant Surgeon at the Freedmen's Hospital.—The United States Civil Service Commission announces that on October 29-30, 1901, an examination will be held in any city in the United States where postal free delivery has been established, for the position of assistant surgeon at the Freedmen's Hospital. The examination will consist of the subjects mentioned below, which will be weighted as follows:

1. Letter-writing	5
2. Anatomy and physiology	10

3. Surgery and surgical pathology..... 20
4. Chemistry, materia medica, and therapeutics 10
5. Bacteriology and hygiene..... 15
6. Theory and practice of medicine and general pathology 25
7. Obstetrics and gynecology..... 15

Total.....100

The examination will be divided as follows: First day, first four subjects; second day, remaining subjects. The age limit is twenty years or over. From the eligibles resulting from this examination it is expected that certification will be made to positions of assistant surgeon at the Freedmen's Hospital, Washington, D. C., at a salary of $1,000 to $1,500 per annum, and to other similar vacancies as they may occur. This examination is open to all citizens of the United States who comply with the requirements, without regard to race or to political or religious affiliations. All such citizens are invited to apply; but attention is invited to the fact that the Freedmen's Hospital is an institution for the treatment of colored patients, and it is understood to be the practice of the Department to appoint only colored persons to positions therein. Applicants shall be examined, graded, and certified with entire impartiality and wholly without regard to any consideration save their ability as shown by the grade they attain in the examination. Persons who desire to compete should at once apply to the United States Civil Service Commission, Washington, D.C., for application forms 304 and 375, which should be properly executed and promptly forwarded to the Commission.

Tri-State Medical Society of Alabama, Georgia and Tennessee.—The following supplementary list of papers is announced: Spinal Cocainization, by R. E. Fort, Nashville, Tenn.; Treatment of Acute Lobar Pneumonia, by W. S. Britt, Eufala, Ala.; Local Anesthesia as Applied to Mucous Membranes, by G. H. Price, Nashville, Tenn.; Tuberculosis: Its Relation to Marriage and Heredity, by J. A. Witherspoon, Nashville, Tenn.; The Necessity of Careful Diagnosis, Prognosis and Treatment in Some Diseases of the Heart, by L. W. Johnston, Tuskegee, Ala.; An Operation of Tubal Pregnancy Complicated with Appendicitis and Fibroid Tumors of the Uterus, by P. U. Brown, Troy, Ala.; Traumatic Injuries of the Brain, Report of Cases, by Hugh Boyd, Scottsboro, Ala.; Hernia, by G. Manning Ellis, Chattanooga, Tenn.; Surgical Shock, by D. S. Middleton, Rising Fawn, Ga.; Rodent Ulcer, by A. R. Robinson, New York; Acute Mastoiditis, by J. A. Goggans, Alexander City, Ala.

Mississippi Valley Medical Association.—The twenty-seventh annual meeting of the Mississippi Valley Medical Association adjourned at Put-in-Bay, after a most successful session, on the morning of the 14th, out of respect to our martyred President.

The following officers were elected for the ensuing year: President, S. P. Collings, M.D., Hot Springs, Ark.; First Vice-President, J. C. Culbertson, M.D., Cincinnati, O.; Second Vice-President, Paul Paquin, M.D., Asheville, N. C.; Secretary, Henry Enos Tuley, M.D., Louisville, Ky.; Treasurer, Thos. Hunt Stucky, M.D., Louisville, Ky.; Chairman Committee of Arrangements, A. H. Cordier, M.D., Kansas City, Mo.

The twenty-eighth annual meeting will be held in Kansas City, Mo., in October, 1902.

CORRESPONDENCE.

TRANSACTIONS OF FOREIGN SOCIETIES.

German.

ARTIFICIAL ENDOCARDITIS—MIDDLE-EAR DISEASE—THROMBOSIS OF THE SIGMOID SINUS AND INTERNAL JUGULAR VEIN—FEATURES OF THE BUBONIC PLAGUE IN BOMBAY—GENERAL DISEASES AND THEIR INFLUENCE UPON THE FUNDUS OF THE EYE—MENTALLY-UNSOUND CHILDREN AND THEIR TREATMENT.

MENZER, at the Gesellschaft der Charité-Aerzte in Berlin, June 20, 1901, exhibited the heart of a rabbit in which malignant endocarditis had been produced by the intravenous injection of streptococci recovered from a case of malignant endocarditis in man. The cocci did not differ in any discoverable bacteriological details from such as are found in the synovia of joints after acute rheumatism and often in many cases of angina. The relation among these diseases, at least so far as this cause is concerned, is at least obvious.

TRAUTMANN read a paper on middle-ear disease and pointed out that the conditions of an external approach through the external auditory canal and an internal approach through the Eustachian tube are favorable to the onset of these troubles. Furthermore, they are unfavorable to the efficacy of ordinary preventive measures, and nullify these against such causes as currents of cold air and congestion induced by cold baths while the body is overheated. The cylindrical epithelium of the tube which extends from the posterior nares can very easily be affected and damaged by all of the acute and chronic inflammations. General health and particularly the peculiar vulnerability of children are very important factors. The active influence of bad nasal therapy, especially douches, must not be forgotten as a fruitful producer of middle-ear disease. The course of the disease is determined by the nature and virulence of the bacteria. Among 76 cases streptococci occurred in 46, pneumococci in 20, staphylococci in 20, and tubercle bacilli in 3. The dry form is not uncommon and usually after many relapses leads to various degrees of deafness. Then there are several types of exudative inflammations; the seromucous occurs usually as

the children's form, the fibrinous, as that present in nephritis and ulcerative endocarditis. The purulent types always are severe and have intense symptoms. For the treatment of otitis media purulenta are to be recommended dry gauze tamponade and free drainage by opening the mastoid cells. If this opening does not quickly close necrosis of the bony walls or of the small bones of the middle ear is probably the cause.

STENGER stated the results of his investigation of a large number of temporal bones with reference to the relation of the bulb of the internal jugular vein and the sigmoid sinus and their combined bearing upon thrombosis in each. The exact relation of these two venous channels to the tympanic cavity is a varying one. In certain cases the wall of the cavity is in part not bony, but venous, the channels lying to this extent exposed. In such individuals the danger of infection and later of thrombosis must be very great. The indications deducible from these anatomical facts are that, when the symptoms of thrombosis are present and after exposing the sigmoid sinus it is found to be free of clot, the bulb of the jugular vein should be brought to view because that may be the site of the thrombus.

M. HAHN, at the Berliner medicinische Gesellschaft, June, 25, 1901, read notes on his observations of the bubonic plague in Bombay and other localities in India during a stay there of two and a half months. The first question to be raised is whether the original defences against the plague had been stout and energetic enough, in view of the rapid and widespread advance of the disease throughout British India. The opinion of the writer was that they had not been. This has been practically admitted by the English authorities, who are, however, proceeding in Egypt with the same definite activity against it as the Germans did in Germany against the cholera in 1892. The foreign visiting physician has free access to the hospitals. The local medical authorities do not appear to suffer from any great fear of the bacilli. The attendants at the hospitals are on the whole rather indifferent. Washing facilities are the most imperfect. Common sense is very much lacking in this matter and also in the fact that rather too free access to the sick is permitted the relatives who hover about the bed, supply much of the nursing and sanitary service and often cook the food. All this certainly opens the door wide for the spread of the infection. Ordinarily the treatment is carried on by the Hindoo physicians whom the natives themselves are apt to prefer. The transportation and registration of the sufferers are very well ordered. The latter can not very well be absolutely perfect, because here and there cases are hidden. The strict isolation of the patients and the evacuation of all infected houses can not well be carried out, say the English, on account of the peculiar superstitions of the natives. True disinfection, as it is understood in Europe, can not be accomplished on account of the religion, caste customs and other social peculiarities and political organization of the country. In Egypt, at least in the harbor cities where European customs and civilization are at least familiar to and respected by the populace, it has proved quite easy. In Europe where these things are a matter of every-day knowledge, the most rigid precautions will, of course, be readily taken. The mere knowledge of one fact about the cause of a plague is not a victory over it. For example, although the cause of the malarial poisoning has been known for some time, this knowledge did not promise the means of eradicating the disease until the discovery of the means of infection in the mosquito. We are now somewhat in hope of eradicating the germ. Syphilis on the other hand is not yet assigned definitely to a bacterial cause, but the source and manner of the infection are fully familiar to all. Were it not for various difficult social problems this disease, too, could be stopped. The exact source of inoculation is not yet determined in the bubonic plague. Rats certainly play a considerable rôle at the outset, but later it is for each person some definite avenue of attack. Children appear in India to be stricken rather through the mouth. Adults usually have wounded feet from the habit of going barefoot. It is probable that a considerable decrease in the plague would occur if the Hindoos could be induced to wear shoes. The author has not found one rat dead of the bacilli. Immunity conferred by inoculation, Haffkine's method, promises well, but has not yet fully established its results. A reliable measure of protection is not yet found. A serum curative of the disease is now on the market there for which great results are claimed. If true, this serum will reduce the mortality from 90 to about 12 per cent; but, unfortunately, the universal supply of this serum is not yet possible, because the doses are so large, 100 c.c. at a time up to the total of 1500 c.c. Such large quantities are still difficult to produce. The prospects of good serum are still not bright, because this one is purely germicidal and not at all antitoxic. Under his observation the bubonic plague takes the character of a sepsis only just before death. Through the rest of its course it is purely a toxemia. An improvement in the general outlook in India can not be expected until all the hygienic factors are improved. Without a general elevation of the national intelligence this is well-nigh out of the question.

LITTEN, at the Verein für innere Medicin in Berlin, July 1, 1901, elucidated the relationships between some of the lesions of the fundus oculi and general disease. In 1876 he began his studies in this field, especially of the septic processes and their effects upon the eye. By this it is not to be understood purely secondary panophthalmitis, but those white streaks and spots which, alternating with small hemorrhages, appear about the papilla of the optic nerve. The conclusions he then published were that these signs appear in 80 per cent. of his total of 35 cases then recorded, that such patients almost invariably died, that the disease always ran an acute course and that the eye signs usually appeared just before death. His later ob-

servations tend to confirm the former. The eye complications occur, however, in only 30 to 40 per cent. of all cases, are not always precursors of death, do not persist after the patient has recovered from his disease, and are most common in the protracted cases. On the basis of continued observation during the last ten years the author acknowledges that these limitations are on the whole correct. If the prognostic value of their presence is also to be limited, he holds fast to the conviction that their diagnostic significance is highly important. We have to distinguish the retinal condition found in septic troubles, nephritis, pernicious anemia, leukemia, diabetes and scorbutus and to remember always the possibility of tuberculous choroiditis. Following upon his clinical observations, he made a number of pathological tests endeavoring to clear up the essence of these lesions. This seems to be an exudate into the nerve sheath. Why, however, it should always appear in the same layer and at the same point can not be fully explained.

SINELL, at the Aertzlicher Verein in Hamburg, June 25, 1901, read a paper on the mental deficiency of children and its treatment. He at first sought to define the various grades of mental incapacity and said that absolute insanity and mere feebleness of intellect must be distinguished. In the first group of patients come those who are merely weak-minded, but are still capable of instruction. The prognosis so far as the social relations are concerned and the therapeutic considerations, is much the same in all classes of cases, and the somatic importance of a differential diagnosis must not be neglected. Under idiocy, it is to be understood that there lies some severe cerebral disease in childhood or in early adolescence, which has resulted in the partial or total loss of the power of receiving and interpreting external impressions, although not in the loss of many of the ordinary mental processes of life. The final outcome of the lesions is more or less disturbance of the motor, sensory and intellectual processes. Only the most rigid and careful examination will reveal the differential diagnosis between true idiocy and mere mental insufficiency. Between these two conditions there are very many transitional stages. The importance of training-schools for these poor children can not be overestimated. The most essential point of all is that this condition be early recognized. As a rule, such children suckle poorly, cry almost continually, are nervously restless and excited, often blind and deaf or appear so. Under imbeciles, on the other hand, one must not include a mild degree of idiocy. Here is often found some moral defect or antisocial element. For the detection of such imbeciles one must investigate the existing degree of the power of attention, spontaneous or voluntary, color sense, hearing, taste, smell, etc. Deficient muscular sense is the cause of the awkwardness and muscular weaknesses of these patients. Many times the bodily origin of these nervous troubles is adenoid growths, whose removal may be promptly curative. The therapeusis is for the merely feeble-minded and approved home-training, with much patience and the aim of developing the afflicted. Occasionally an asylum is necessary where the same processes are to be followed. Special effort toward the development of the perception, attention, speech and muscular systems must be made. Rest, freedom from nervous irritation and avoidance of bodily punishment and maintenance of good environment are all to be observed. One must always remember that these conditions as such are really totally incurable. The idiot may, however, by instruction, be developed so that he can take care of himself and respect the rest of the community, but the imbecile can never be trusted and must therefore always be confined.

OUR LONDON LETTER.

(From Our Special Correspondent)

LONDON, Sept. 14, 1901.

THE NEW SCHEME OF ARMY MEDICAL REFORM—A VICTORY FOR THE DOCTORS.

THE Government scheme for the reform of the Medical Service of the Army has not yet been promulgated, but it has been passed by the Treasury, which is generally the greatest obstacle to delivery in official parturition. Only a general idea has so far found its way to any one outside the charmed circle of the War Office. I am, however, by special grace—whether of God or the (printer's) devil, I will not say—in a position to give you an outline embracing all the essential features of the scheme. So slow are the movements of our Government that it is probable enough that your readers will know the details of the scheme some time before they come to the knowledge of those most concerned here.

I should say first of all that the scheme is in the nature of an agreeable surprise. As has been said in previous letters, Mr. Brodrick, the Secretary of State for War, has on several occasions been distinctly unsympathetic in his references to the medical officers of the Army, and has even seemed sometimes to go rather out of his way to treat them with hardship. It was therefore expected that his scheme would be of a character that would make it unacceptable to the medical profession. I am bound to say, however, that it bears every sign of having been inspired by a real desire to satisfy the legitimate demands of the profession, while securing the efficiency of the service. The fundamental feature of the scheme, in which it differs from all the Royal Warrants on this subject previously issued, is that the service will in future be controlled by an Advisory Board. This means that instead of a Warrant, which may be made a dead letter in practice by the perverse ingenuity of the War Office or even by the personal whim of a commanding officer, the medical service will be controlled by a living organism whose special function it shall be to administer the scheme in the sense intended by its framers, and to modify its details as experience may suggest or special circumstances may re-

quire. The controlling power in the administrative machinery of the Army Medical Service will therefore be sufficiently elastic to adapt itself readily to the ever changing conditions with which it has to deal. Of course, everything will depend on the constitution of the Board. If it were to be merely a select body of more or less ornamental dummies, like Napoleon's senators, who should simply prophesy smooth things to the Secretary of State for War, it would be no improvement on the existing system. But pains have been taken to to make the composition of the Board representative not only of the service itself but of the civil profession. The Board is to consist of the director general and the assistant director general of the service; of an officer of the Royal Army Medical Corps with special knowledge of sanitation; an officer of the same Corps possessing special knowledge of tropical diseases; two civilian physicians and two civilian surgeons chosen by the Secretary of State; and one representative of the War Office. Of this Board the director general is to be chairman and is to have a casting vote in all questions where opinions are equally divided. If he is a strong man, this will leave him practically master of the field. The civilian members of the Board are to be chosen from among the staff of one of the great teaching hospitals; they must not be less than forty-five years of age or over sixty. In this way it is hoped to exclude the fossil element which is so apt to paralyze the efficiency of boards of all kinds. The Board is to meet fortnightly, and three members at least are required to form a quorum, one of whom must be a civilian. The constant presence and living influence of the civilian element is expected to keep the military element, which generally shows a tendency to early ossification of the intelligence, up to the mark.

Through this Advisory Board the Medical Service of the Army will be governed by the Secretary of State. It will keep a watchful eye on all military hospitals, and on individual officers; it will control examinations and personally inspect all candidates, to see what manner of men they are, before they are admitted to the service. It will receive reports on the working of the service in every detail, and make representations to the Secretary of State on these reports and on all such other matters as it considers important for the efficiency of the service. Though the Board will be only "advisory," it will scarcely be possible for even the most autocratic Secretary of State to treat its "representatives" lightly; if he does, he can be called upon to justify his action in the House of Commons. On the other hand, it will be out of the power of the most militantly military Commander in Chief to pursue the policy of the Duke of Cambridge and Lord Wolseley, to whom it seemed to afford a special satisfaction to snub "the d—d doctors." The dislike of the former for the doctors is believed to have had its origin in the fact that during his inglorious career in the Crimea his life was saved by an army surgeon who took command at a critical moment and brought His Royal Highness, rather the worse for wear, out of the fight. Wolseley's hatred of the medical officers is particularly remarkable in the view of the facts that he had a brother in the department, and that the wars in which he won his laurels were really victories of sanitary science. Henceforth the Commander in Chief, if he allows himself to show the insolence of office upon occasion, can speedily be brought to book.

Admission to the medical service will still be by examination, but instead of being worried with questions on anatomy, zoology, etc., the candidate's knowledge will be tested clinically and practically. Promotion in the junior ranks will be by examination, for which six months' special preparation in a hospital fully equipped with laboratories, etc., will be compulsory. In this way every officer before attaining the rank of major will have gone through at least a year's extra study in a place where all the means of furnishing knowledge and practical skill to the highest point are available. Beyond the rank of lieutenant colonel promotion will be entirely by selection. This is a further indication of the determination, as far as is possible, to weed out incompetence and fogeyism. Encouragement is to be given to men to make themselves specially proficient in operative surgery, laryngology, dermatology, etc. The pay of all ranks is to be materially increased from the youngest lieutenant who, including allowances of one kind or another, will get $1,850, up to the director general, who will get $10,000 a year.

The scheme of reform includes the establishment of a great military hospital with not less than 500 beds in London; and a Medical Staff College, also in the metropolis. Here as a rule officers studying for promotion will go through their special training.

On the whole it may be said that by the new scheme everything asked for by the medical profession has virtually been conceded. The rank and titles remain as they are; the pay is increased to an extent sufficiently to remove this particular grievance; opportunities are given to the officers of the service to keep their professional knowledge up to date; and they are no longer to be at the mere mercy of the War Office, which has neither a body to be kicked nor a soul to be damned. The Advisory Board can be called to account jointly and severally by the press; and the caprices and prejudices of military officers from the Commander in Chief to the youngest captain can be effectually held in check. To medical journalists this unconditional surrender of the military authorities is particularly gratifying, for the victory is due almost entirely to the medical press.

Bellevue Hospital Exonerated.—Bellevue Hospital authorities were exonerated from blame for the death of John Chrystie in the pavilion for the insane attached to that institution on June 18, as a result of an investigation held Wednesday before Coroner Bausch and a jury.

SOCIETY PROCEEDINGS.

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA.

Fifty-first Annual Meeting, held at Philadelphia, September 24, 25, 26, 1901.

FIRST DAY—SEPTEMBER 24TH.

The meeting was called to order by the President, Dr. T. D. Davis, of Pittsburg.

The opening session was devoted to the reports of committees, new business, etc. Resolutions expressing sympathy for Mrs. McKinley were adopted.

Address in Otology.—This address was delivered by Dr. E. N. Buckman of Wilkesbarre. The speaker mentioned the progress in this branch during the last six years, stating that mastoiditis was considered a very serious disease when he began practice, now radical operations are so successful that abortive treatment is not long kept up in any case. This is one of the most satisfactory conditions the aurist has to treat. The least satisfactory and one which shows the least progress during the last five years is tinnitus. The cause is not definitely known, but there is slowly increasing deafness where tinnitus is the chief symptom. Often there are constrictions in the Eustachian tube. Success in treatment is not marked in many cases Bougies may be used, but they are apt to break and do not remove the constriction. Massage benefits some cases. To be useful it must be vigorous. During the past four months Dr. Buckman has used electricity, mainly in obstinate cases not benefited by other treatment. The time is too short to admit of definite conclusions, but he thinks the claims made for electricity are not exaggerated. It will give good results in many cases. Success in treating these cases depends more on how remedies are used than on the means employed.

Some Aural Complications of Influenza.—Dr. S. MacCuen Smith of Philadelphia spoke on this subject. Inflammation of the middle ear due to influenza is noted for the intensity, rapidity, and virulency of its action. The hemorrhagic form is more frequent than those from other causes. Mastoid implication and irritation are present in all severe cases. Two cases of primary mastoid abscess have been seen. In influenzal otitis suffering continues after spontaneous rupture of the membrani tympani. A bacteriological examination of all ear discharges is of great value, although other bacilli may take the place of the exciting cause after some time. The character of the infection cannot be judged from the odor of the discharge as is sometimes attempted. Dr. Smith has seen and studied particularly 23 cases and he enumerated some of the general characteristics. Nine were of the hemorrhagic variety. Fourteen terminated in spontaneous rupture of the membrane after forty-two hours, the pain continuing afterward for from twenty-four to sixty-four hours. In six cases the membrane was incised early in the attack with prompt relief of pain. Prophylaxis is of utmost importance in cases of influenza and if aural complications do arise they should be treated boldly. Rest in bed with a milk and broth diet (or, better still, fasting for two or three days), diuresis and diaphoresis are the best measures that can be instituted. Influenzal earache yields stubbornly to hot applications, but hot antiseptic solutions may be tried. Prompt incision of the membrane should be made when any distension is noticed.

Incudectomy for Progressive Hardness of Hearing, Tinnitus Aurium, and Ear Vertigo.—Dr. Chas. H. Burnett of Philadelphia said that progressive hardness of hearing is caused by atropho-neurosis of the muscular structures in the Eustachian tube, nasopharynx, and middle ear. There is finally caused an impaction of the stapes in the oval window. In ear vertigo there is contraction of the tensor tympani muscle. The surgical treatment recommended aims to overcome this retraction of the tensor tympani and ossicles. Surgical intervention often wards off the occurrence of the same process in the opposite ear.

Reasons for Early Operation in Acute Mastoiditis.—Dr. Wm. H. Dudley of Easton said that the experience of physicians should make a paper on this subject unnecessary, but such is not the case. Several cases were detailed to show the evil consequences of deferred interference.

In the discussion of these papers Dr. Burnett said, in answer to the question as to what symptoms in mastoiditis called for operation, that there were three, namely, pain, pyrexia, and prolapse. The latter refers to prolapse of the upper, posterior part of the membrani tympani and the adjoining external auditory canal.

Ocular Affections in Childhood Associated with Impaired General Nutrition.—This paper was read by Dr. S. D. Risley of Philadelphia. He said that the true condition in these cases was generally not recognized until a thorough ophthalmological study was made. This is a reason for speaking of them from the ophthalmological point of view. Two cases were cited. In both there was astigmatism and changes in the fundus. Correction of the eye defects combined with internal treatment, removal from school, etc., effected a cure in both. The clinical picture in all such cases is practically the same—impaired vitality, headache, general malaise, precarious temper, etc. With these is combined some form of asthenopia. A question to be solved is to what extent eye strain at school affects general nutrition.

Gumma of the Ciliary Body.—This interesting case was reported by Dr. Edward Stieven of Pittsburg. The patient was a woman who had been treated for tertiary syphilis and who supposed herself cured. After a time she reappeared with involvement of the nose and of one eye. This was in December, 1900. Ex-

amination of the eye then and subsequently showed a gumma of the ciliary body with involvement of the lens and vitreous, sight being finally lost. Enormous doses of potassium iodide, as high as 240 grains three times a day, and large doses of strychnine were given. Improvement began and by July, 1901, there was vision of six-eighths, the gumma having apparently entirely disappeared. The inference is that prognosis in these cases should not be hopeless.

Contagious Diseases of the Eye and Their Treatment.—In this paper Dr. S. Lewis Zeigler of Philadelphia reviewed the varieties of contagious eye diseases and pointed out their treatment by general practitioners.

Address in Mental Disorders.—This was delivered by Dr. Robert H. Chase of Philadelphia, who chose as his subject "Paresis From the Standpoint of the General Practitioner." It is a mistaken idea to think that this affection is to be dealt with by the specialist alone. The general practitioner sees the cases first and at the time when treatment is of avail—early in the disease. In forming the diagnosis it is best to take the patient unawares. At first he is conscious of ill feeling; afterward he feels well. Theft and acts of indecency are often committed years before the diagnosis is made from other symptoms. Amnesia is often shown early. Physical signs are indefinite. An outline of treatment for the early stages is to remove the cause if possible, prohibit coition, and the use of alcohol, reduce the patient's work, and place him under favorable hygienic conditions. Partial rest treatment and hydrotherapy are valuable in some cases. Rest and removal from daily surroundings should be advised in cases which are only suspected. An additional duty of the physician is to prevent marriages that would cause hereditary tendency to the affection.

Two Cases of Muscular Dystrophy in Brother and Sister.—Dr. A. A. Eshner of Philadelphia briefly detailed these cases. Both are typical cases of the disease. Interesting points are that the father received an injury to the brain by a fall when sixteen years of age and that there is a paternal history of obesity, four of the father's sisters each weighing more than 220 pounds. Of Dr. Eshner's 20 cases, 2 showed the condition at birth, 8 within five years, and 10 within ten years. There were 16 males and 4 females.

Prognosis in Neuritis.—This subject was briefly presented by Dr. F. Savary Pearce of Philadelphia. Pressure neuritis is to be differentiated from occupation neurosis. The prognosis is more favorable in the former, but relapse is apt to recur. Septic neuritis is usually favorable, nerves showing a certain immunity to pus. The prognosis in alcoholic and metallic neuritis is uncertain owing to relapses. In diphtheritic neuritis the affection seems to be less severe in those cases which have not been given antitoxin. Gonorrheal neuritis is usually local and chronic.

Cases of Hysteria.—Dr. Edward E. Mayer of Pittsburg cited cases to illustrate the difficulty of diagnosis. Some points emphasized were that hysteria is always a psychic disease; that non-hysteric stigmata of degeneration are generally found in hysterical subjects; that the prognosis is less favorable as these stigmata are more pronounced; that the treatment is to remove the prime factor.

The President's Address was delivered Tuesday evening, Dr. Davis chose for his subject "The Pioneer Physicians of Western Pennsylvania." The departure from the usual custom of treating a purely scientific subject was well received by the Society. Dr. Davis' description of the early history of Pittsburg and vicinity and its physicians was thoroughly enjoyed by all who were fortunate enough to hear him.

SECOND DAY—SEPTEMBER 25TH.

Address in Medicine.—This address was delivered by Dr. John B. Donaldson of Canonsburg. It was not too optimistic as regards the present condition in the State. The speaker said that but little had been done by the State in preventive measures against tuberculosis or in caring for the indigent tuberculous. They need not be sent South or abroad. Pennsylvania's own hills are ample. The existence of slums in the large cities is a blot on the age. They can be done away with whenever it is demonstrated that it will pay. Disease is not fought at home as we fight it abroad—at Havana for instance. Filtration is retarded by schemes of contractors. "White wings" clean the avenues, but alleys are neglected. Of great promise is the raising of the standard of medical education. Dr. Donaldson prophesies that ere long we will see an end of the so-called "schools" of medicine, and all physicians will work alike for one end—the eradication of disease.

Gastroptosis and Its Treatment.—This was the subject of a paper by Dr. J. Dutton Steele of Philadelphia. Gastroptosis may exist absolutely without symptoms. When present they are generally those of gastric motor insufficiency. A study of 50 cases showed the order of frequency to be (1) gastroptosis and dilatation combined; (2) dilatation alone; (3) gastroptosis alone. Females are most affected and the condition most frequent in males is simple dilatation. Pressure from above is the most frequent cause of the condition. Any method of examination for diagnosis except that of inflation is unreliable. Tartaric acid and sodium bicarbonate are occasionally used for inflation, but the stomach tube is essential for thorough examination. Air can be forced in by the bulb of an atomizer. The stomach can be mapped out in every case. The air should be allowed to escape before withdrawing the tube. Examination of the gastric contents is of no value in diagnosis. Treatment consists in proper diet, lavage if there is retention, and mechanical support. For the latter an elastic bandage is best and it should be held in place by

perineal straps. Pads should also be bound on the abdomen. The stomach should be distended with air after the belt is applied to see if it is in proper position.

Movable Kidneys; Their Effect Upon the Gastric and Intestinal Functions.—Dr. Boardman Reed of Philadelphia stated that in many cases all the abdominal viscera were involved together, being movable and prolapsed to some degree. The etiology of movable kidney is lack of development of the muscles of the abdomen and unhygienic methods of dress. Pregnancy has nothing to do with the condition. Digestive disturbance is the most prominent symptom. Movable kidneys often act as a stimulant to gastric secretions and sour eructations are caused. Insomnia and constipation are also symptoms and neurasthenia is almost sure to follow. As to prognosis a certain number of cases can be cured without surgical intervention if the patient can afford the treatment. If the kidney is tender or painful, confine the patient to bed from two to six weeks, apply retentive apparatus, and fatten and build up in every way. Stubborn cases often develop hyperchlorhydria and intragastric faradization may be needed. If further trouble persist nephropexy may be done.

Discussion.—Dr. Gibbon of Scranton stated that the use of pads was a mistake as they may cause appendicitis. The reversed corset is the only exterior appliance that should be used. If not effectual, operate and at the same time remove the appendix.—Dr. John G. Clark of Philadelphia changed the subject of his paper and spoke on the treatment of movable kidney. The more conservative methods should be first tried. When there is separation of the recti muscles he is in favor of Webster's operation, *i. e.*, removal of the fascia and uniting of the muscles.

Infective or Malignant Endocarditis.—Several cases of this condition were reported by Dr. A. O. J. Kelly of Philadelphia. Etiology and diagnosis were the points treated. Acute endocarditis is believed to be a single process. Gradations depend upon the virulence of bacteria present and the resistance of the individual. The name endocarditis is a misnomer. Bacteria are found in secondary lesions and in emboli and the blood. The condition is properly pyemia or bacteremia. Toxin of the bacteria is believed to be the only etiological agent in some cases, as the bacteria themselves are not found on the valves. Three factors are of value in making the diagnosis: (1) The leucocyte-count, including differential; (2) bacteriological examination of the blood; (3) symptoms referable to the heart, the so-called arythmic disturbance. In the discussion Dr. J. M. Anders emphasized the importance of applying modern methods in the study of these cases. In contradistinction to some other speakers, Dr. Anders believes that some value must be attached to the occurrence of murmurs. These, with the occurrence of embolic phenomena and the presence of bacteria in the blood, serve to make the diagnosis. In supposed easy cases the trouble should be taken to eliminate other conditions which simulate it, notably typhoid fever.

A Few Notes on the Salts of Sulpho-Carbolic Acid.—This was the title of a paper by Dr. Edgar M. Green of Easton. The value of sodium sulpho-carbolate in arresting fermentative changes in the gastro-intestinal tract was emphasized. Acetanilid and the drug mentioned work well together in alleviating headaches. A smaller dose of the former will give the same effect when combined with the sodium salt.

Primary Abdominal Tuberculosis.—This paper was presented by Dr. Lawrence F. Flick of Philadelphia. Dr. Flick believes that 25 per cent. of all cases of tuberculosis begin in the belly. The diagnosis is exceedingly difficult. It is for the abdominal surgeon to furnish a symptom-complex by which the disease can be recognized. In all cases of chronic indigestion, persistent backache, diarrhea, leukorrhea, etc., when accompanied by loss of weight and strength, tuberculosis should be suspected. Treatment is unsettled as yet. Opening the abdomen cures some cases. A general building-up treatment is indicated. The use of iodoform is worthy of a trial.

Discussion.—Dr. Joseph Price of Philadelphia said that in former years surgeons blundered into the treatment of these cases, the diagnosis not having been made, the operation possibly being done for some other condition. Statistics of results by pioneer surgeons were favorable and for a time he has not refused to open an abdomen for tuberculosis. Surgeons have always made the error of being afraid of adhesions following operation. Iodoform is of great value in these cases and the whole peritoneum and its contents can be made yellow with it and no toxic effects follow. In one case only enough iodoform to cover eight inches of intestine was on hand. A second operation was necessary later and showed the eight inches of gut in a healthy condition, the remainder being covered with tubercles and adherent as before. Abdominal tuberculosis is a condition that justifies intraperitoneal liberties never before taken if the exigencies of the case demand it. The more the abdominal contents are manipulated and exposed and douched the better will be the result. The indications then are for (1) early operation; (2) free use of iodoform; (3) drainage.—Dr. Mordecai Price is sure that he has seen cases of abdominal tuberculosis caused from the use of milk from an infected herd. Early exploratory operation in doubtful cases is indicated.—Dr. James Tyson stated that the tuberculin test is the most infallible aid to diagnosis that we have. It is perfectly safe and in his experience almost infallible.—Dr. S. Solis Cohen said that iodoform was a most valuable agent in the treatment of tuberculosis. It can be prescribed internally if care is taken to increase the dose very gradually. From three to four months should be taken to reach the maximum dose. He believes that Theobald Smith is entitled to much more credit for his

statements in regard to human and bovine tuberculosis than is Robert Koch. It would be a serious mistake for physicians, health boards, etc., to take the view that infected meat and milk are not dangerous when our present knowledge is not more definite.

Address in Hygiene.—This address was delivered by Dr. E. B. Borland of Pittsburg and was a running comment on the present-day status medical and sanitary affairs. The great work done in Havana and Santiago was a triumph of modern hygiene, but the death of so many soldiers during the recent war shows the need of more hygiene in the curriculum of medical schools and its promulgation among the people. The prevalence of smallpox now is due to the work of silly and ignorant antivaccinationists and also to the failure of authorities to provide special hospitals. Special hospitals for smallpox, scarlet fever, and diphtheria cases should be provided in every town of over 1,000 inhabitants. Girls should be taught cooking and the hygienic preparation of food. Vile advertising in papers should be stopped. The prevention of tuberculosis is a vital problem. Stoppage of the spitting habit and notification of tubercular cases are to be commended.

The Histories of Three Accidents in Tapping the Chest.—This was the title of a paper by Dr. J. C. Lange of Pittsburg. The first was instant death of a man, seventy-six years of age, from paralysis of the heart the moment the needle was introduced. The patient had albuminuria, arteriosclerosis, and dropsy. No clots were found in the heart postmortem. Case II. was a man, twenty-three years of age, who had a gush of blood (12 ounces) from the trachea during the tapping and hemoptysis for several days. He finally recovered after two tappings and the drainage of an empyema later. Case III. was a female, fifty-eight years of age, who had pleuritis as a complication of biliary cirrhosis of the liver. She also had hemoptysis during, and for some days after, the tapping.

Reforms in Medical Legislation.—Dr. H. M. Shallenberger of Rochester read a paper on this subject. The paper was an arraignment of the existing policy of the majority of medical schools and suggestions for their revision.

The Vermiform Appendix.—Dr. Edmund Holmes of Philadelphia exhibited specimens of colon and appendix showing various forms of the latter organ. In 96 of 110 cases the right lobe of the cecum was larger, causing the appendix to appear nearer the ileum. Forcible distention revealed a tendency to revolve around the ileocecal valve. The left side then is the place to explore for the appendix when it is not readily found. The appendicular artery is usually single, but there can be two or more. The length or displacement of the organ may account for the anomalous symptoms in some cases. The psoas magnus muscle may lead one astray in diagnosis at times.

(To be Continued.)

THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

Stated Meeting, Held June 10, 1901.

The Vice-President, William McCollom, M.D., in the Chair.

Degenerated Nerve-Fibers of Sensory System.—Dr. M. G. Schlapp presented microscopical sections of different parts of the nervous system, showing degeneration of nerve fibers throughout the whole sensory nervous system (column of Burdock and Gall, roots of trigeminus, vagus, glosso-pharyngeal, and acoustic), produced by the indirect effects of an intracranial growth. The degeneration was confined to the intramedullary fibers, and extended only and exactly to where the sheath of Schwann begins to surround the extramedullary fibers. Dr. Schlapp thinks the sheath of Schwann acts as a protecting sheath to the myelin substance; hence the degeneration of the myelin substance is confined to the intra-medullary fibers, having no sheath of Schwann, and that the degeneration primarily is confined to the myelin substance, the effect, no doubt of the direct action of the intracranial pressure or toxic substances (or both) on the myelin substance, and not secondarily through the trophic centers of the fibers degenerated.

Glioma.—Dr. Schlapp also showed a specimen of a glioma stained for about one minute in Delafield hematoxylin, washed in water, and then stained in a solution of acid rubin (Kulschitsky). The combination of these two stains gives a beautifully clear definition of the glia cell with its nucleus and the fibrillæ. The nucleus is stained blue, the cell-body and fibrillæ red.

Pyosalpinx Involving the Appendix Vermiformis.—Dr. Berg presented the right tube and ovary of a patient which were removed for pyosalpinx. When admitted to the hospital the case appeared to be one of ordinary appendicitis with abscess formation, but when the abdomen was opened it was found that the condition was one of pyosalpinx, and that the appendix was involved only by continuity. The woman made a good recovery.

Growth of New Bone from Periosteum.—The first paper of the evening was read by Dr. J. H. Branth. He said that more than twenty years ago he had removed more than one-half of the inferior maxilla, with a view to having a resulting regeneration of the bone from the periosteum. A number of operations were undertaken to remove sequestrated bone, and it took over a year to close the last sinus. One year later but little scarring was visible, and from the contour of the face it would not have been suspected that so much bone had been removed. On touch one could feel that bone substance had been reproduced. Dr. Branth then presented a patient from whom, in 1884, he had removed nearly all of the os

calcis. He took out a large necrotic mass and curetted the empty periosteal sac. The anterior articular part of the bone was healthy and was left remaining as a shell-like body. The result was most gratifying. In the speaker's experience this principle of subperiosteal bone surgery for reproduction of bone has been applied with varying success. Even where failure resulted nothing was lost, for at a later stage an operation for removal of the entire inflamed part could always be undertaken. In order to determine the application and limitations of such procedures, he took up the consideration of some features of growth, nutrition, repair, degeneration and necrosis, as having to do with periosteum and bone substance. From this study it was apparent that subperiosteal surgery, generally speaking, is limited to cases of necrosis, and does not include in its range cases in which malignant constructive or destructive cell-life exists. After necrosis of a part of a bone has resulted it may occur that the periosteum, having been lifted off the bone, may deposit bone-cells on its under surface and so build a bridge, as it were, over the necrotic substance for some distance, while at some small outlet the débris makes an exit. Such a condition will not permit healing until the sequestrum has been removed, which Nature alone accomplishes by a slow process of disintegration into débris that becomes portable through the avenues of exit. The indications for treatment are plain. The surgeon should aid Nature to get rid of the dead bone substance, but operative interference should be delayed until the line of demarcation between living and dead tissues can be detected, and then the dead bone can be removed piecemeal from the openings, which may be enlarged by incisions. There must be a limited osteitis during the repair of a fracture, which repair is primarily and for the most part accomplished by the periosteum; and later, when the medullary canal is re-established, the endosteum will also contribute to the restoration to the normal condition. In order to secure the best results in amputations the surgeon should take pains to cover the end of the bone stump with a flap of periosteum. In operations for cleft palate we depend on transplantation of muco-periosteum for material to close the gap. While the principle of reproduction of new bone from periosteum is of comparatively limited application, in suitable cases it may be carried out with a fair prospect of success, especially where delay is possible.

Cerebral Concussion, with Retinal Changes.—Dr. L. A. W. Alleman read a paper on the above subject. Retinal changes have not been frequently observed, and the case on which the paper was based presented some very unusual features. Mr. X., a young man in perfect physical condition and a prominent member of the football team of one of the great universities, had been under observation since January, 1897, when he was first examined and given a correcting glass. On October 28, 1900, the day after an intercollegiate game in which he had taken part, he presented himself, complaining that for some time he had been suffering from discomfort in reading, similar to that experienced before using glasses and that he was annoyed by a blur before the left eye, of recent development. His corrected vision, which had been 20/15 on all previous examinations, was found to be reduced to 20/20 in the right eye and 20/100 in the left, and could not be improved by a change of glass. Ophthalmoscopic examination: Scattered about the fundus of both eyes were pigment spots and degenerative plaques of small size, which suggested old hemorrhages. The nerve margins were indistinct and the retinal vessels markedly tortuous. In the right eye, midway between the macula and disc, was an area showing pigment absorption and indefinite retinal changes, and in the left, a slight haze extending over the entire fundus and attributed to retinal edema. On the following day a small fluffy spot, just above the fovea, could be seen in the left eye, even with an undilated pupil. This retinal picture in a patient in such apparent health was alarming, since, on account of previous examinations, an old lesion could be excluded. Incidentally it was discovered that in the football game the patient had received a rap on the head, which had "knocked him out" for a few moments. He said that he had seen double and had been dazed for the remainder of the game. This accident was of so little importance, in the young man's judgment, that he had forgotten it when questioned about an injury. He had frequently received many such raps and thought nothing of them. This discovery suggested a possible explanation of the retinal changes and of the old hemorrhages, but a thorough physical examination was requested. Shortly afterward vision was found to be normal in both eyes. This seemed to show that the impairment in the latter had been due to concussion (so-called commotio retinæ), and not to the minute lesion at the macula, which was still perceptible. The physical examination proved entirely negative. The patient was absolutely sound and showed none of the minor evidences of vascular disease. In discussing the case the author referred to the remarkable ability acquired by athletes to withstand and react from injuries which would be disabling or well-nigh fatal to the ordinary individual. A week later an examination showed vision to be 20/15 in each eye. The right fundus was entirely normal, save the old pigment spots. In the left the picture was clear and bright. The tortuosity of the vessels was much diminished and now confined to the larger vessels. The spot in the macula had entirely disappeared.

Concussion and Eye Lesions.—While some authors explain all eye lesions following concussion of the brain as the result of either meningitis or fracture, this is manifestly impossible in the cases showing ocular symptoms immediately after the injury, and making a complete and rapid recovery. As most writers restrict the term commotio retinæ to the result of direct violence to the globe, we are obliged to place cases due to head injuries in a separate class. The fact that the condition has not been discovered oftener does not argue that it is of rare occurence, for the majority of the cases would ordinarily escape observation. The question suggests itself whether the spots occasionally met with in otherwise healthy retinæ, which point to old hemorrhages, may not be the mark of a previous traumatic hemorrhage. Holt and Neal have reported a series of cases of concussion, some of which were due to indirect violence. From these and from a few isolated cases we can make out a fairly distinct clinical picture of retinal concussion form indirect traumatism. Recovery is usually rapid and complete, but there is always the possibility of permanent impairment of vision. The cases due to indirect violence seem to be practically identical with those of concussion of the ball, when the blow is of only moderate severity. As no entirely satisfactory explanation has as yet been offered of the manner in which concussion gives rise to the retinal complication, Dr. Alleman was inclined to agree with Seely in throwing the burden on the neurologist.

Spurious Cases.—Dr. Alexander Duane said that genuine cases of the kind described by Dr. Alleman were very rare. Spurious cases are not uncommon. They comprise, first, those in which the eye itself has been directly injured by the force causing the concussion of the brain; second, those in which a disturbance of vision of a purely central origin, a hemiopia, for example, is present; third, cases, in which the disease of the fundus really antedated the concussion, but was latent or only slightly manifest.

Conditions Present in Genuine Cases.—The conditions obtaining in the genuine cases include commotio retinæ, as in Dr. Alleman's case (although commotio retinæ is much oftener due to blows upon the eye itself), hemorrhages, and, as isolated curiosities, retinitis and rupture of the retina. There may also be produced, as in one case of his own, a condition simulating retinal thrombosis. This is probably due to contraction of the retinal vessels resulting from the sudden reduction of the cerebral circulation. If the blood-vessels are already abnormally narrow, such contraction, as has been proved, may be extreme enough to cause the symptoms of a permanent occlusion. As regards commotio retinæ he thought the theory of a sympathetic involvement explained it most plausibly.

Case of Cerebral Concussion and Hystero-Epilepsy.—Dr. W. B. Noyes read this paper, which will appear later in the MEDICAL NEWS.

NEW YORK ACADEMY OF MEDICINE.—SECTION ON ORTHOPEDIC SURGERY.

R. H. Sayre, M.D., Chairman *pro tem.*

Correction of Deformity.—Dr. Royal Whitman presented a patient upon whom he operated in 1897 for the correction of a very marked anterior bowing of both legs. The operation was an osteotomy of the tibia, fracturing of the fibula, division of the tendo Achillis and direct forcible correction of the deformity. He presented the case to show the good results; the operation seemed preferable to cuneiform osteotomy as it resulted in lengthening the bone somewhat.

Rotary Lateral Curvature of the Spine.—Dr. Whitman showed a girl with marked lateral rotary curvature of the spine. Four years previously he had treated her for clubfoot and had not seen her since. He advised for this patient manual correction and fixation in plaster jacket. He called attention to the complete range of dorsal flexion present in the foot. His treatment had been manipulation and the plaster bandage.

Dorsal Pott's Disease.—Dr. Whitman showed a boy treated for Pott's disease in the dorsal region with his anterior shoulder-brace in connection with the ordinary back-brace, and called attention to the fact that there was no forward inclination of the shoulders nor flattening of the chest, as is usually the case in deformity of this region.

Ankylosed Elbow-Joint.—Dr. W. R. Townsend showed a man with angylosed elbow-joint flexed just short of a right angle, to show the great range of motion preserved to an arm where the fixation of the elbow had occurred in a favorable position.

Pott's Disease Without Deformity.—Dr. Townsend presented a second patient who two years prior to his seeing him complained of pains of a girdle character in his back and abdomen. There was stiffness of the lower portion of spine, but no evidence of deformity. Diagnosis of Pott's disease without deformity was made and a plaster-of-Paris jacket applied. The jacket was removed after four months at patient's request; all pains had disappeared, and there was a question as to possible error of diagnosis. The patient subsequently returned with a large cold abscess in the left lumbar region, with psoas contraction. The man felt no pain and was unwilling to have jacket reapplied. The abscess and spinal stiffness made the diagnosis of Pott's disease certain. Dr. R. H. Sayre said he had under observation a case similar to the one of Pott's disease shown by Dr. Townsend. The patient had girdle pains, pains down the thighs, difficulty in bending and great pain on being jarred; no deformity. Diagnosis of Pott's disease made and plaster jacket applied. Some-

time later the patient developed paralysis of both lower extremities. After a year the paralysis disappeared and a large pelvic abscess developed which was opened in the inguinal and lumbar regions. Later there formed in the opposite side another abscess which was opened. At present there is a very slight irregularity noticeable at the fourth and fifth lumbar vertebræ. The pressure of the abscess accounted for the paraplegia.

Fracture of the Neck.—Dr. Sayre showed a man who some months previously had fractured his neck by falling. Following the injury, he had paralysis of the lower extremities and partial paralysis of the upper extremities with no control of bladder or rectum. When seen by Dr. Sayre two months after the injury, the patient's neck was rigid. A diagnosis was made of fracture with dislocation of the third and fourth cervical vertebræ—verified by use of the X-ray. The treatment consisted in getting the head into a good position and applying an apparatus to support the head and hold the neck. The man had been under treatment three months and movements of head were good; apparatus would be discarded. He cited other cases, and said splints were frequently removed from fractures too soon and before good osseous union had taken place.

Deformities of the Elbow-Joint.—Dr. Samuel Lloyd read the paper of the evening, entitled: "The Operative Treatment of Deformities of the Elbow-Joint Resulting from Traumatism." He said three things were recognized in fractures into the elbow-joint: First, it is not always possible to tell even under an anesthetic and with the most careful examination just what the joint injury is. Second, it is not always possible to replace the fragments even approximately. Third, ankylosis results in certain cases in spite of any plan of treatment. All fractures involving or in vicinity of the elbow-joint should be examined under an anesthesia, and the fragments placed in apposition and the limb dressed in a position that enabled the operator to retain them in place most efficiently. He favored flexion. He was decidedly opposed to passive motion so much advocated by the older surgeons, believing that this caused an increase of callus and consequent diminished range of motion. Any passive motion in an elbow-joint until after the bone was firmly united was meddlesome surgery. If, when the splint was removed, motion did not return promptly by active motion (an attempt on the part of the patient to use it regularly) the deformity should be examined. If the joint did not yield under an anesthetic, then the difficulty was probably due to obstructing callus or a displaced fragment. He believed the ankylosis or limitation of motion due to bone and not to fibrous adhesions, provided there had been no septic complications. While his first operations and conclusions antedated the use of the X-ray, the latter had been corroborated by an extensive use of the X-ray. The overproduction of callus was a constant danger of producing ankylosis and was increased by any motion of the fragments during the period of union; provisional callus was objectionable, bone united in the same manner as the soft tissues, with but little granulation tissue, if firmly held together. The X-ray has been somewhat disappointing in solving all the difficulties of fracture work, since it gives only a shadow of the real object. The X-ray, however, so frequently illustrating dislocation complications, had emphasized the necessity of using an anesthetic in the first examination of fractures about the elbow-joint. The majority of cases of ankylosis of the elbow following fracture being due to bony displacement or to callus if non-operative measures were not successful in removing these causes, something should be done to put the bones in proper position. In compound fractures, all agreed as to what should be done—enlarge the wound and suture the fragments in position. But it was with simple fracture that he dwelt upon. At first sight cutting into the joint and manipulating the structures about the joint, including the capsule, would result in almost if not absolute fixation. Such had not been his experience; the fear of attacking a joint surgically was largely a relic of pre-asceptic times.

He cited the different fractures occurring in the vicinity of the elbow-joint and illustrated his paper by a series of skiagraphs of cases he had operated upon, one, a supracondyloid fracture of the humerus, where the difficulty was found to be due to both callus and displacement. The arm had been treated at an angle of 145 degrees, the condyles were carried backward while the shaft of the bone was drawn forward. In flexion the coronoid process of the ulna struck upon the mass of callus below the more prominent projection of the shaft, while the ulna rested upon the sharp end of the diaphysis in the complete flexion. This boy had a useless arm. The projecting portion of the diaphysis was chiseled off and a new coronoid fossa was cut out with a curette until complete flexion was possible. The result was remarkably satisfactory. In spite of the extensive dissection necessary to reach the anterior surface of the humerus and the consequent lacerating and bruising of the capsule and synovial membrane, flexion was obtained almost to the full extent. Skiagraphs were shown further illustrating varieties of fractures about the elbow-joint complicated by callus and dislocation upon which he had operated generally with success. He summed up the management of fractures of the elbow in the following words: (1) Examination and reduction under ether. If the latter is impossible, and it is evident that disability will result in consequence, immediate incision and dissection until the fragments can be forced into position and wired or sutured. If, however, this is still impossible, the fragments should be removed. (2) If ankylosis or marked limitation of motion results and does not prove to be due to fibrous bands, operation should be undertaken and everything opposing the proper

movements of the joint should be cut away. He said when he performed his original operation in 1894, he was unable to find any records of previous operations of the kind, but now many. The open method of treatment had been advocated much earlier in irreducible dislocations of the elbow and it seemed strange that it was so late in coming into more general use in fractures. In all his cases, twenty-one in number, the posterior incision similar to that made for excision of the joint was employed. This answered well for manipulation of the olecranon fossa of the humerus or the injuries to the condyles. The difficulty of clearing out the coronoid fossa and managing the anterior displacements was greater. He varied the incisions according to the injury. The capsule should be as carefully opened and sutured as the peritoneum. He said one could scarcely be too radical in removing bone; it was better to try for both flexion and extension than to stop short of removal of any obstruction. After removal of bone he flushed the joint with hot normal saline solution, sutured the capsule carefully and closed the wound without drainage. Rest in flexed position for one week, then massage and active motion. Dr. Lloyd also presented two patients upon whom he had operated to further illustrate his paper.

Dr. B. Farquhar Curtis opened the discussion of Dr. Lloyd's paper with the remark that he approached these injuries followed by bad deformity of the elbow-joint with great caution; these operations were among the most difficult of surgical procedures and a great test of the asceptic methods of the operator. He thought suppuration was very apt to occur and if so, particularly if serious, the benefit of the operation was lost. Another point was the impossibility of calculating upon the production of new bone or of checking its formation, the overproduction being almost certain to occur. Again, fracture, particularly in children, was near the epiphyseal line and the surgeon was often confronted with the necessity for removing the epiphysis with the result of checking the growth of the limb. He differed with Dr. Lloyd in that he treated recent fractures of the condyles of the humerus with loss of the carrying point, in the extended position for ten to fourteen days, then flexing the elbow-joint—other cases in the flexed position from the first; massage began within the second or third week in all fractures near the elbow-joint. Dr. A. B. Judson commented upon Dr. Lloyd's use of skiagraphy, saying that he had not seen a more useful application of the X-ray to surgical procedure.

Effect of Flexion of the Spine on Rotation.—Dr. Judson exhibited a stick of sponge-rubber made to represent the spine, with pins in place of the spinous processes. The object was to see whether flexion or extension were able to affect in any way the rotation which accompanies lateral curvature. The model had been photographed (1) in lateral curve combined with flexion and (2) in lateral curve combined with extension, but it was seen that in either case there was no trace of rotation. Further observation and reflection brought to light the fact that the curve in either case was in reality a simple curve. Although produced by a combination of a lateral and an antero-posterior curve, it was in reality a simple curve lying somewhere between the two, the resultant of two forces, but with no more power to affect rotation than any other simple curve however produced. It had been suggested that if flexion could really be considered as causing rotation, its opposite, extension, would be useful in combating rotation. Too much, perhaps, could not be said in favor of forced extension, as in the treatment of Pott's disease. The immediate effect of this would be to transfer the weight from the bodies to the processes, which would be a good thing, as the processes were held near the middle plane and were, therefore, less abnormal in their position than the bodies which in curvature swung away from the middle plane. This freedom of the bodies combined with arrest of lateral motion on the part of the processes was what produced the phenomenon of rotation.

Dr. Charles H. Jaeger demonstrated the Lorenz hip redresseur—a simple and convenient apparatus for the application of bandage to the lower extremity, its chief use being to correct faulty positions of the limb and then to hold the limb in the corrected position while the fixation bandage was applied. Its advantages are (1) dispensing with one or two assistants; (2) retaining limb in position; (3) stronger traction than could be applied by hand and kept up evenly. He presented a patient wearing a Lorenz spica. Attention was called to necessity of carefully modeling the plaster over the iliac crests, also to the padding used—first, a tricot which enveloped leg and abdomen, then a thin layer of ordinary non-absorbent cotton cut in strips four or five inches wide, glued on both sides and applied like a roller bandage.

Dr. Sayre had seen an apparatus similar to the redresseur, devised by Bruns of Tubingen. He thought that of Lorenz superior. Dr. Gibney expressed himself as much pleased with the redresseur.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

READY REFERENCE HAND-BOOK OF DISEASES OF THE SKIN. By Dr. G. T. Jackson. Fourth Edition. Demi 8vo, 642 pages. Illustrated. Lea Brothers & Co., New York and Philadelphia.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. By Dr. James M. Anders. Fifth Edition. 8vo, 1297 pages. Illustrated. W. B. Saunders & Co., Philadelphia and London.

NERVOUS AND MENTAL DISEASE. By Drs. A. Church and F. Peterson. Third Edition. 8vo, 869 pages. Illustrated. W. B. Saunders & Co., Philadelphia and London.